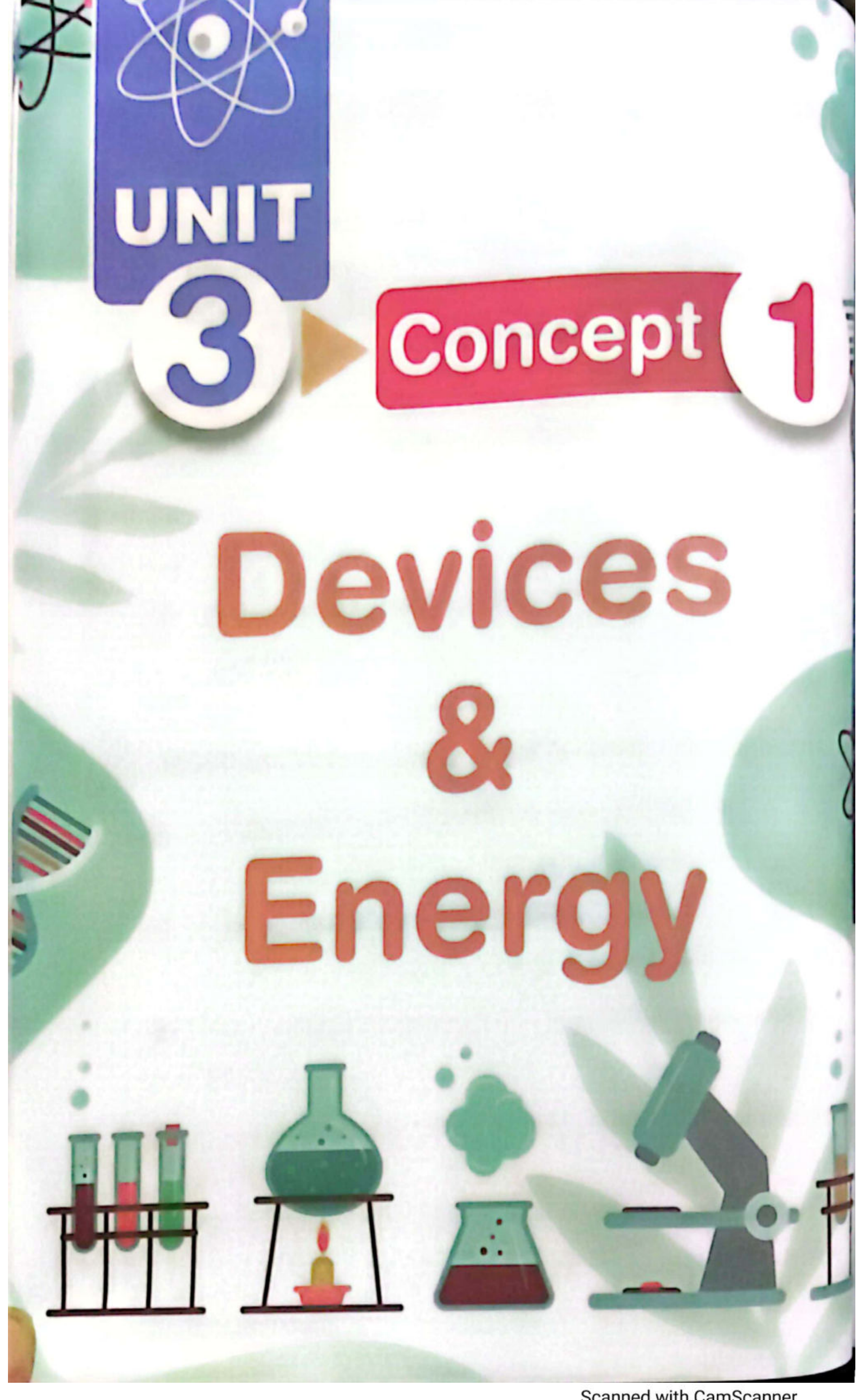

UNIT
3
Concept
1
Devices
&
Energy


Unit Lessons:
Lesson 1 Can you Explain?
Lesson 2 Devices and Energy
Lesson 3 Law of Conservation of Energy
Lesson 4 Energy Flow
Lesson 5 Energy and Controlling It

Lesson 1 Can you Explain?

هل تستطيع الشرح؟

» Energy can be changed from one form to another.

» يمكن أن تتحول الطاقة داخل الأجهزة من صورة لأخرى.

Device		Energy Consumed	Energy Produced
Electric lamp		Electric	Light & heat
Electric iron		Electric	Heat
Radio		Electric	Sound
TV		Electric	Sound & light
Cellular phone		Electric	Sound & light

Technology helps us to change solar energy into other forms:

Device	Energy Consumed	Energy Produced
Solar cells	Solar	Electric
Solar heater	Solar	Heat



1 Fill in the gaps using the following words:

(electric – heat – solar - radio – consumed – produced – solar cells)

1. The .... changes electric energy into sound energy.
2. The electric heater consumes .... energy and produces .... energy.
3. Electric energy is the energy .... in a TV.
4. Light energy is the energy .... from a TV.
5. Solar cells change .... energy into electric energy.

2 Put (✓) or (✗):

1. Energy can be changed from one form to another. (   )
2. TV consumes electric energy. (   )
3. TV and cellular phones produce light energy only. (   )
4. Solar cells produce heat energy. (   )

Toy Cars Operated by Remote Controls
السيارات اللعبة التي يتم التحكم بها عن بُعد



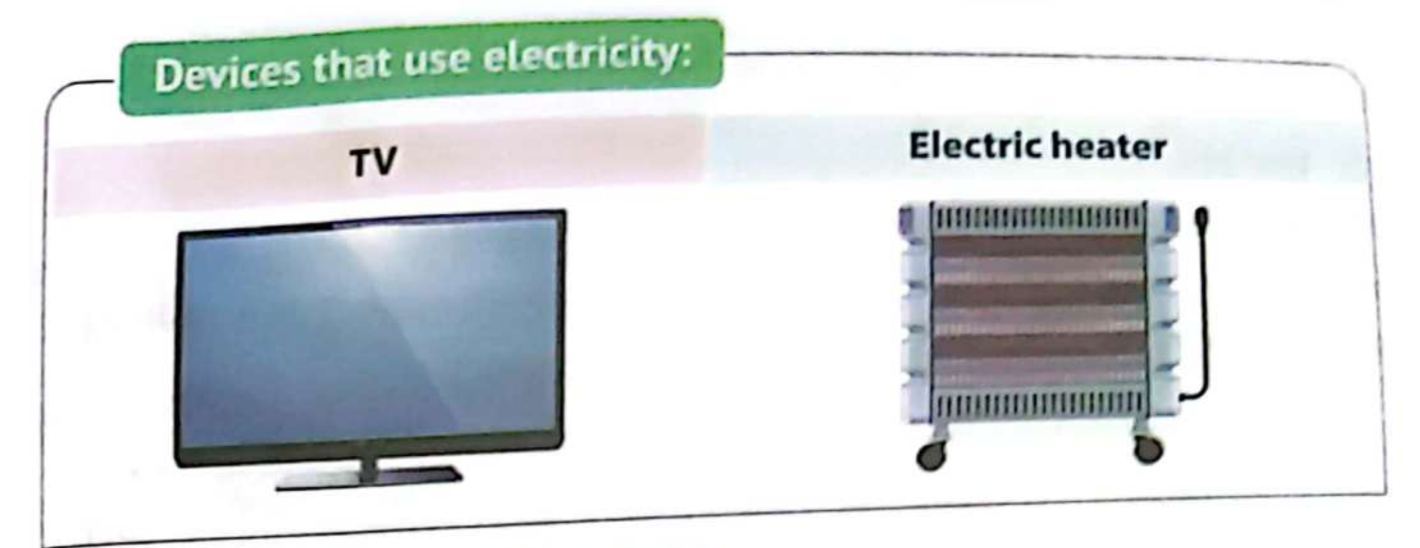
- Toy cars that are operated by a ***remote control*** need energy to operate (move).
- Devices need a source of energy, such as ***batteries*** to operate.
- Batteries contain ***chemical energy*** that changes to ***electric energy***.

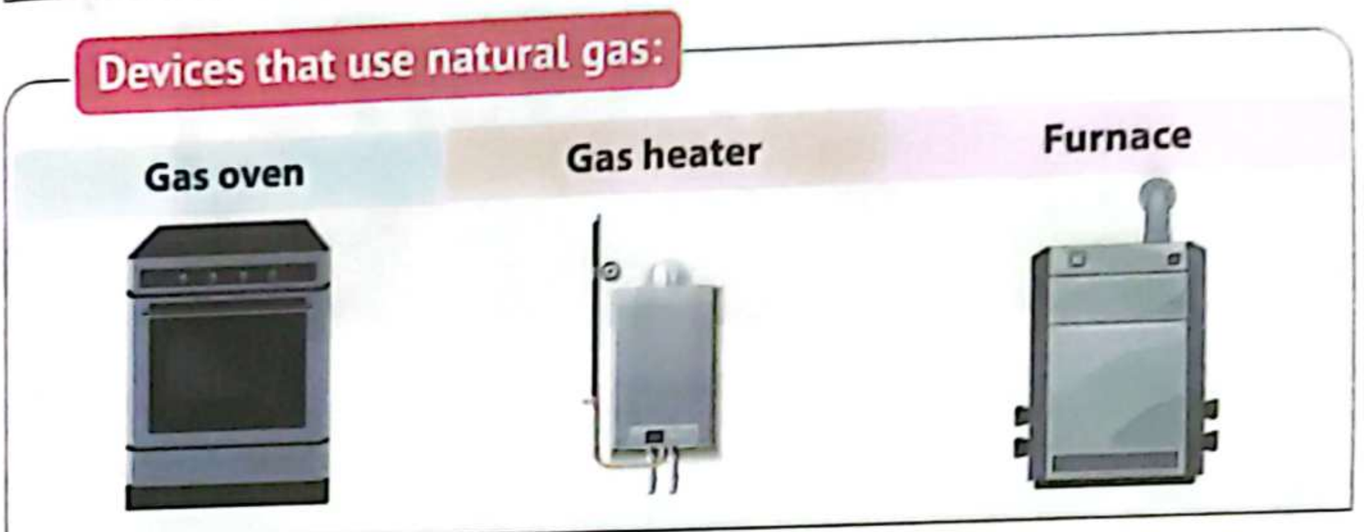
- تحتاج السيارات اللعبة التى يتم التحكم بها عن بُعد إلى الطاقة لتشغيلها.
- تحتاج الأجهزة أيضًا إلى مصدر طاقة كالبطاريات لتشغيلها.
- تحول البطاريات الطاقة الكميائية إلى طاقة كهربية.

Sources of Energy - مصادر الطاقة

Devices that use solar energy (solar cells):

Calculator	Solar heater







1 Complete the following:

1. Toy cars that are operated by a .... need energy to operate.
2. Devices need a source of energy, such as .... to operate.
3. Batteries contain .... energy that changes to .... energy.
4. Calculators use .... energy to operate.
5. Gas ovens use .... energy to work.
6. .... and .... consume electric energy.

Mars Exploration Vehicle – عربة اكتشاف المريخ

- The distance between Earth & Mars is ***54 millions km***.
- The spacecraft needs ***more than 6 months*** to arrive on Mars.
- Humans send robots which are operated by ***remote controls*** to explore Mars.
- One of the most famous robots is ***Curiosity Robot***.



- تبلغ المسافة بين الأرض والمريخ 54 مليون كيلومترًا وتحتاج المركبة الفضائية 6 أشهر للوصول لسطح المريخ.
- أرسل الإنسان روبوتات يتم التحكم بها عن بعد لاكتشاف المريخ ومن أشهرها (كيريوسيتى).

Why is it difficult to obtain electricity to operate robots?

- The robot is very far from any ***plug***, ***electric charge*** or ***markets***.
- It is impossible to connect the charger to the rocket plugs.

ماسبب صعوبة الحصول على الكهرباء اللازمة لتشغيل الروبوت؟

- لأنها بعيدة جدًا عن أى قابس أو شاحن كهربى أو متجر بطاريات.
- من المستحيل توصيل سلك شاحن كهربى من أقرب صاروخ لها.

How do robots obtain electricity?

- We can use ***long-term batteries*** or ***solar panels*** that use solar energy.
- وبالتالى يمكن استخدام: بطاريات طويلة الأمد أو لوحات شمسية (تعمل بالطاقة الشمسية).





How do vehicles get the energy they need to move on Mars's surface to explore it ?

» The vehicle changes **solar energy** to **electric**, **heat** & **kinetic energies** to operate its **sensors** to move on Mars.

« تحول المركبة الطاقة الشمسية إلى طاقة كهربية وحركية وحرارية لتشغيل أجهزة استشعارها لتتحرك على سطح المريخ.



1 Complete the following:

1. The distance between Earth and Mars is ....
2. A spacecraft needs more than .... to arrive on Mars.
3. Humans send robots which are operated by .... to explore Mars.
4. Robots on Mars are very far away from .... or ....
5. Vehicles on Mars change .... energy into .... , ... and .... energies to operate their .... to move on Mars.

2 Put (✓) or (✗):

1. A spacecraft needs about 6 years to arrive on Mars. (   )
2. Robots on Mars move by special long-term batteries. (   )
3. A robot can get energy from the nearest rocket to it. (   )
4. It is possible to connect the charger to the rocket plugs. (   )



Devices and Energy أجهزة والطاقة

Energy & the need of devices to it
الطاقة وحاجة الأجهزة إليها

- Energy makes devices & toys ***move*** and ***do their functions***, such as rotating in angles, moving their arms or operating their cameras.
- The source of energy in devices and toys is the ***chemical energy*** stored in ***batteries***.
- When batteries run out, devices ***stop***.



- ***To make a battery work again,***
  1. we charge it.
  2. we exchange it by a new battery.

Energy Chains - سلاسل الطاقة

- The main source of energy is the ***Sun***.
- Where ***nuclear*** energy changes to ***light*** energy, which is absorbed by the plants to start the chain.



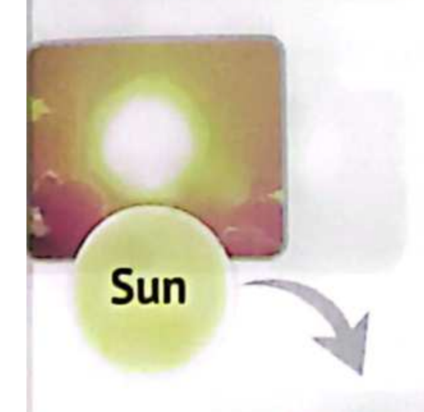


1 Complete the following:

1. Energy makes devices .... and ....
2. The source of energy in devices and toys is the .... stored in ....
3. When batteries run out, we must .... or .... them.
4. .... is the main source of energy.

Examples of Energy Chains

1 Energy chain in eating food, such as orange:



Sun

Light energy



Kinetic energy



Chemical energy stored in food



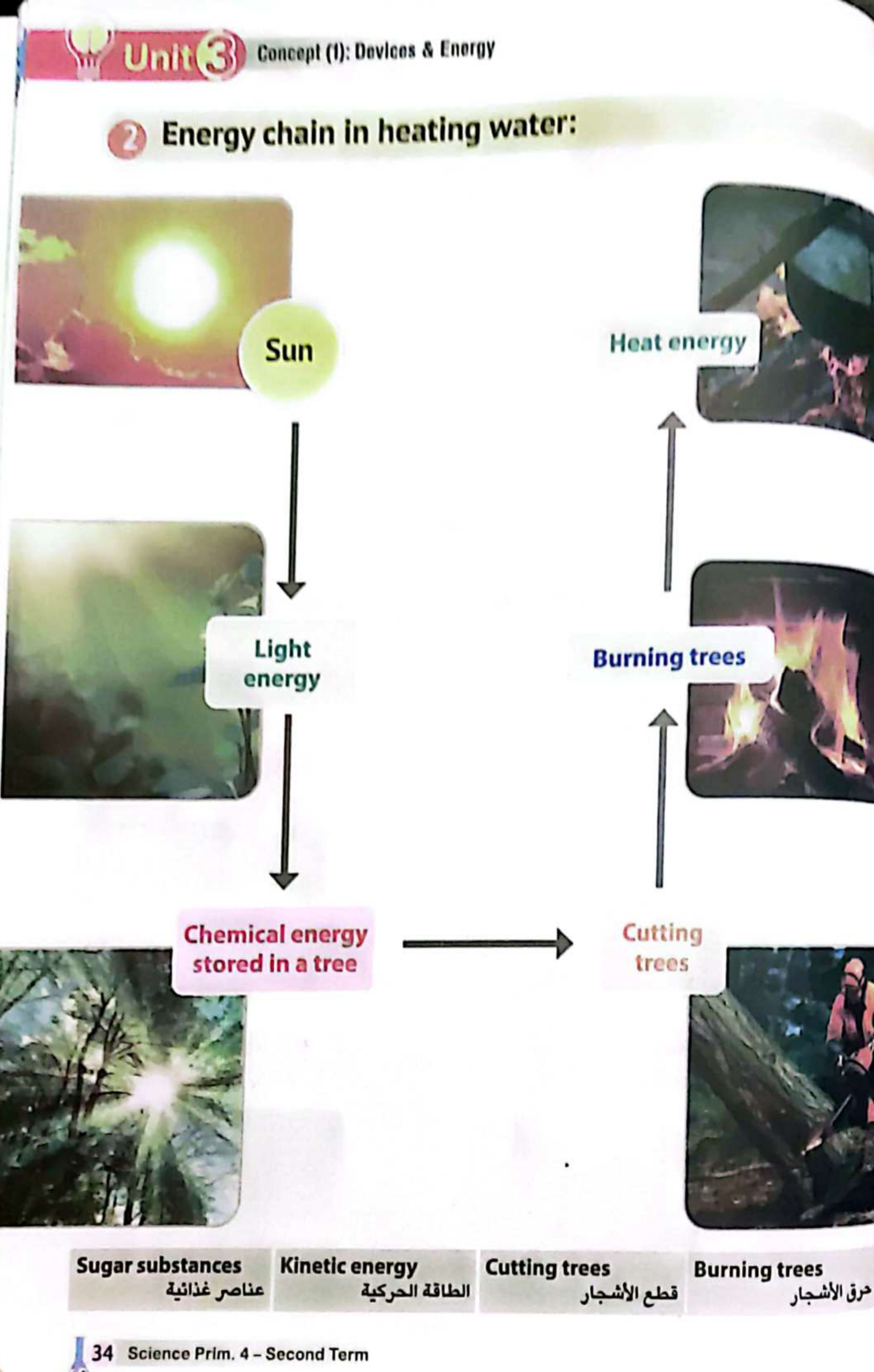


Sugar substances which feed humans





2 Energy chain in heating water:



Sugar substances	Kinetic energy	Cutting trees	Burning trees
عناصر غذائية	الطاقة الحركية	قطع الأشجار	حرق الأشجار

3 Energy chain in a hair dryer:

Sun

Light energy

Chemical energy stored in trees

Cutting trees

Coal

Electric power station

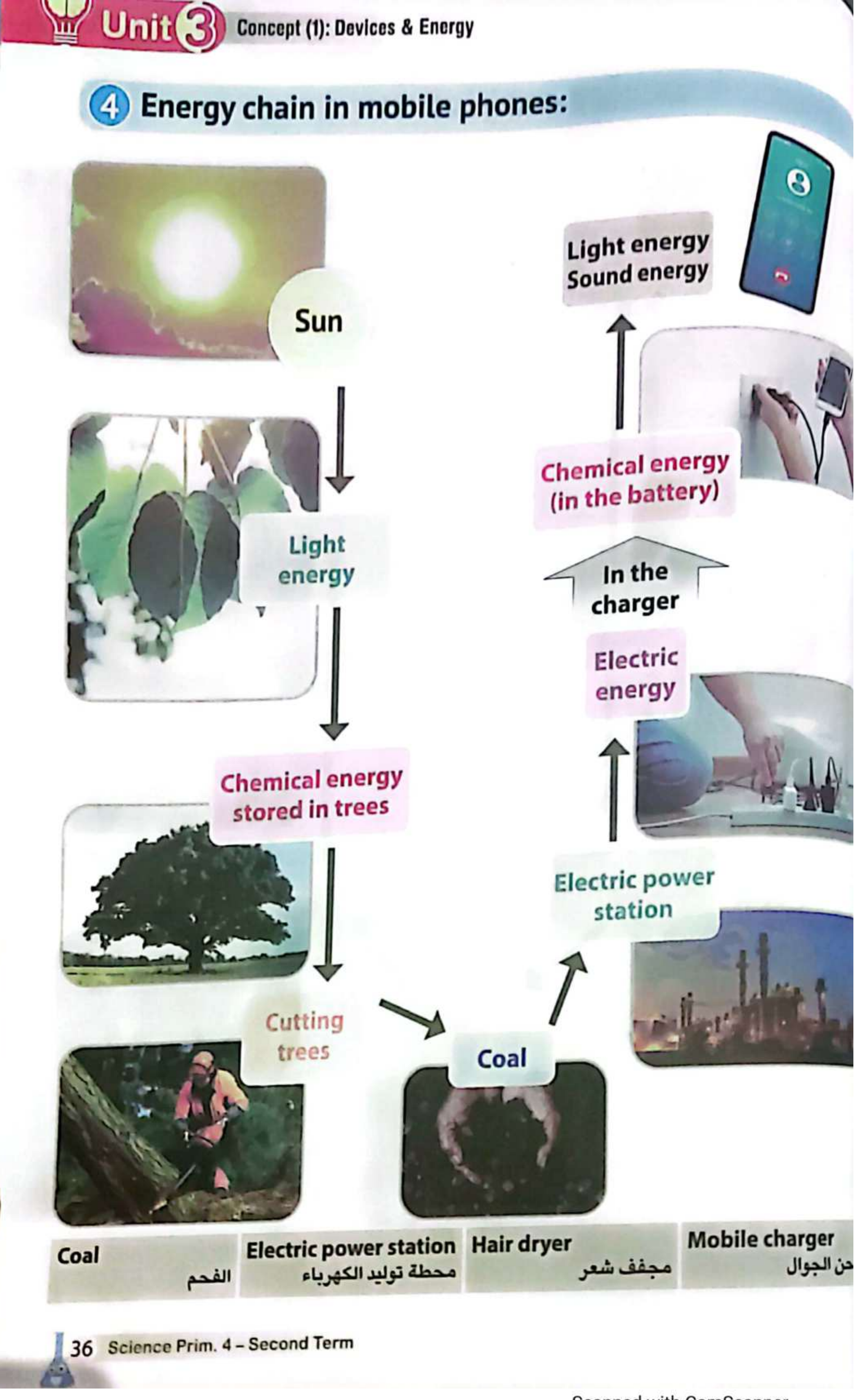
Electric energy

In the hair dryer

Heat energy
purpose: (To dry the hair)
Sound energy
No purpose: (Motor sound)
Kinetic energy
No purpose: (Air movement)

Coal الفحم	Electric power station محطة توليد الكهرباء	Hair dryer مجفف شعر

4 Energy chain in mobile phones:



Coal الفحم	Electric power station محطة توليد الكهرباء	Hair dryer مجفف شعر	Mobile charger حن الجوال





1 Complete the following:

1. Any energy chain starts with the ....
2. .... energy is stored in trees.
3. Electric power stations consume .... and produce ....
4. We can get .... energy by burning trees.
5. ...., ... and .... energies are produced from the hair dryer.

2 Put (✓) or (✗):

1. Any energy chain ends with the Sun. (   )
2. The chemical energy is stored in trees and batteries. (   )
3. Coal is used in electric power stations to produce heat energy. (   )
4. It is impossible to use any device without the Sun. (   )

Energy Transformations - تحولات الطاقة

Device		Function	Energy Input (Incoming/Used/Consumed Energy)	Energy Output (Outcoming/Resulting Energy)
1 Hair Dryer		Drying hair	Electric	Heat (needed for drying the hair) Sound Kinetic (motor & air motion)
2 Soap Dispenser		Dispensing soap	Potential	Kinetic
3 Washing Machine		Washing clothes	Electric	Kinetic
4 Electric Bulb		Lighting houses	Electric	Light & heat
5 Motor Engine		Moving things	Electric	Kinetic
6 Dynamo		Obtaining electricity	Kinetic	Electric
7 Mobile Phone		Making calls	Chemical (in the battery)	Sound & Light

Device		Function	Energy Input (Incoming/Used/Consumed Energy)	Energy Output (Outcoming/Resulting Energy)
8 Bike		Transporting	Chemical (in the human body)	Kinetic
9 Electric Iron		Ironing clothes	Electric	Heat
10 TV		Transferring sound and image	Electric	Sound & Light
11 Fan		Moving the air	Electric	Kinetic
12 Small Watch		Knowing time	Chemical	Kinetic
13 Toy Car		Toy for kids	Elastic potential	Kinetic
14 Hand Bell		Getting attention	Kinetic	Sound



1 Complete the following:

1. .... is used to make calls, while .... is used for knowing time.
2. .... is used to get electricity, while .... is used to move things.
3. An electric fan changes .... energy into .... energy.
4. A bike changes .... energy into .... energy.
5. A small watch changes .... energy into .... energy.
6. A hand bell changes .... energy into .... energy.
7. A toy car changes .... energy into .... energy.
8. .... and .... change electric energy into kinetic energy.

2 Put (✓) or (✗):

1. A hair dryer changes electric energy into heat energy only. ( )
2. Dynamo is used to move things. ( )
3. Electric energy is the resulting energy in electric bulbs. ( )
4. A hand bell is used to know the main four directions. ( )



Lesson 3 Law of Conservation of Energy
قانون بقاء الطاقة



On driving a bike:



Chemical energy



Kinetic energy



- A part of the kinetic energy changes to *heat energy* due to the friction between the bike wheels and the road.

2 In the electric lamp:



Electric energy



Light energy



- A part of the electric energy changes to *heat energy*, so you feel hot when you approach your hand to it.

From the previous:

Law of Conservation of Energy
قانون بقاء الطاقة

Energy is neither *created* nor *destroyed* but it changes from one form to another.

الطاقة لا تفنى أو تستحدث من العدم ولكن يمكن تحويلها من صورة لأخرى.



1 Complete the following:

1. On driving a bike, ... energy changes to .... energy.
2. A part of the kinetic energy of the bike changes to .... due to the .... between the road and the bike wheels.
3. An electric lamp changes .... energy into .... energy.
4. When you approach your hand to an electric lamp, you feel ....

2 Put (✓) or (✗):

1. Energy is neither created nor destroyed but it can be changed. (   )
2. The moving bike changes kinetic energy into chemical energy. (   )
3. The electric lamp changes electric energy into light energy only. (   )



تدفق الطاقة
Energy Flow

» Energy is saved and is neither created nor destroyed.

« الطاقة محفوظة ولا يمكن أن تفنى أو تنعدم.

Hair Dryer:



Input Energy	Output Energy
Electric energy	***Heat energy*** purpose: (To dry the hair)
	Sound energy No purpose: (Motor sound)
	Kinetic energy No purpose: (Air movement)

Mobile Phone:



Input Energy	Output Energy
Electric energy	***Light energy***
	Sound energy
	Data processing معالجة البيانات



1 Classify these energies in mobile phones to input and output

(Electric energy – Heat energy – Sound energy – Kinetic energy)

Input Energy	Output Energy
....	....
....	....
....	....
....	....

2 Classify these energies in electric lamps to input and output:

(Electric energy – Heat energy – Light energy)

Input Energy	Output Energy
....	....
....	....
....	....
....	....





Lesson 5 Energy and Controlling It
الطاقة والتحكم بها

1 Ecologists علماء البيئة

a They check the flow of energy through the food network in the ecosystem because any change in the flow of energy affects the living organisms.

» يتحقق علماء البيئة من تدفق الطاقة خلال الشبكات الغذائية في النظام البيئى حتى لا تتأثر الكائنات الحية.

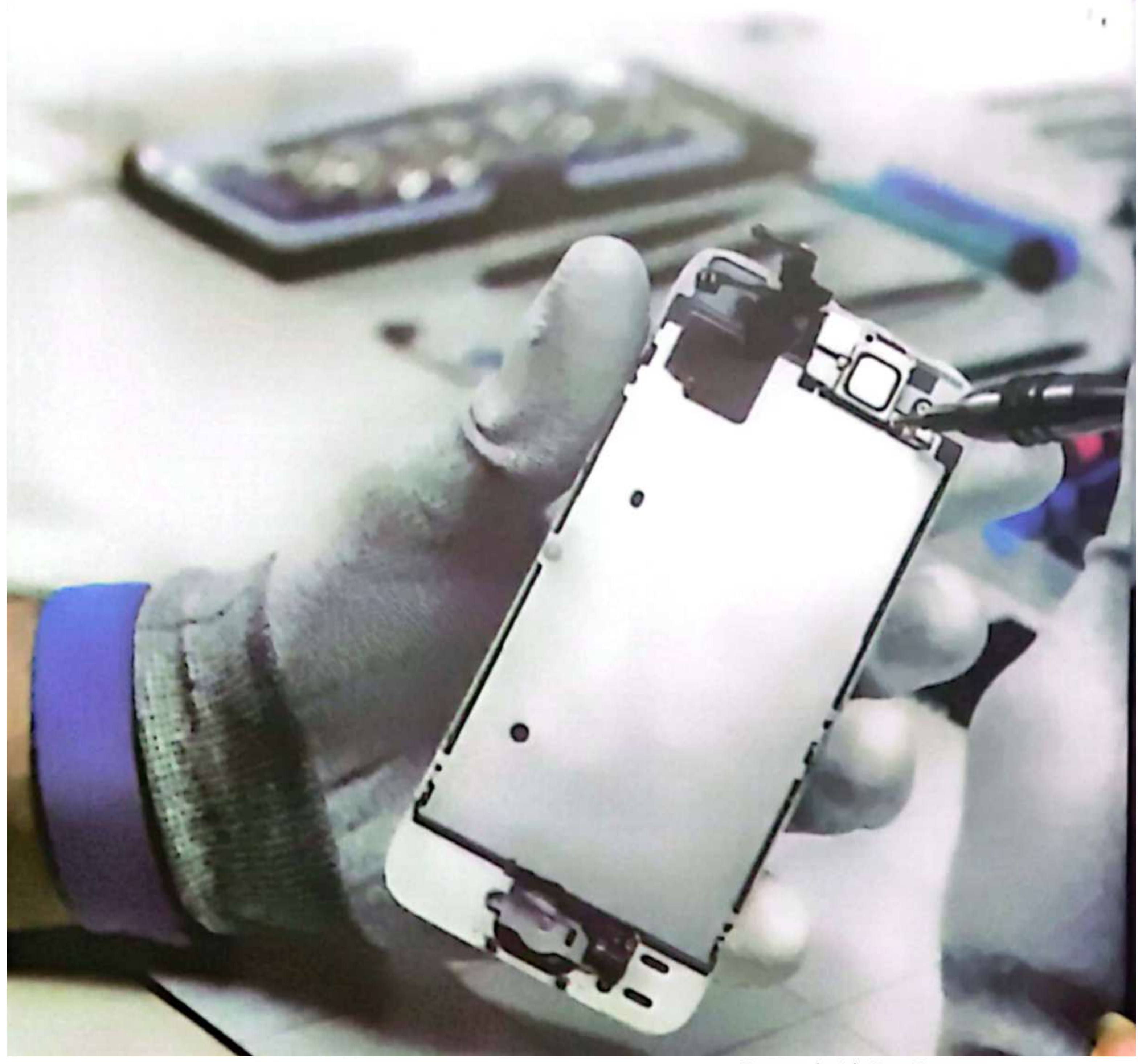
b They study the flow of energy in difficult ecosystems, such as the North Pole or the ocean bottom.

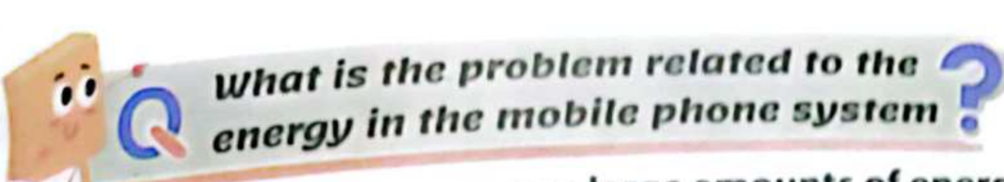
» يقومون بدراسة تدفق الطاقة الغذائية فى الأنظمة البيئية الصعبة مثل القطب الشمالى أو قاع المحيط.

2 Engineers المهندسون

» They design solutions for problems, such as how the mobile screen obtains the light energy.

« لتصميم حلول للمشكلات المتعلقة بالتكنولوجيا مثل كيفية حصول شاشة الموبايل على الطاقة المطلوبة لتضيء.

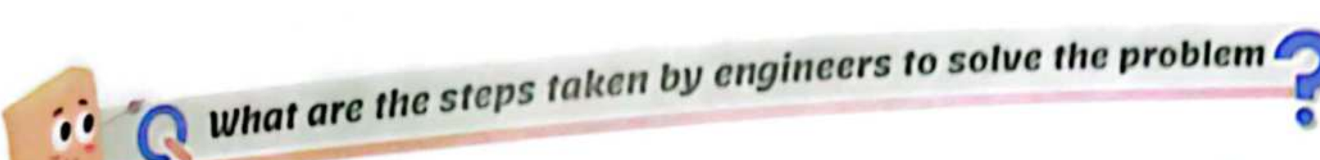




» The mobile phone consumes large amounts of energy in a short time.

سؤال ما هي مشكلة الطاقة المتعلقة بجهاز الموبايل؟

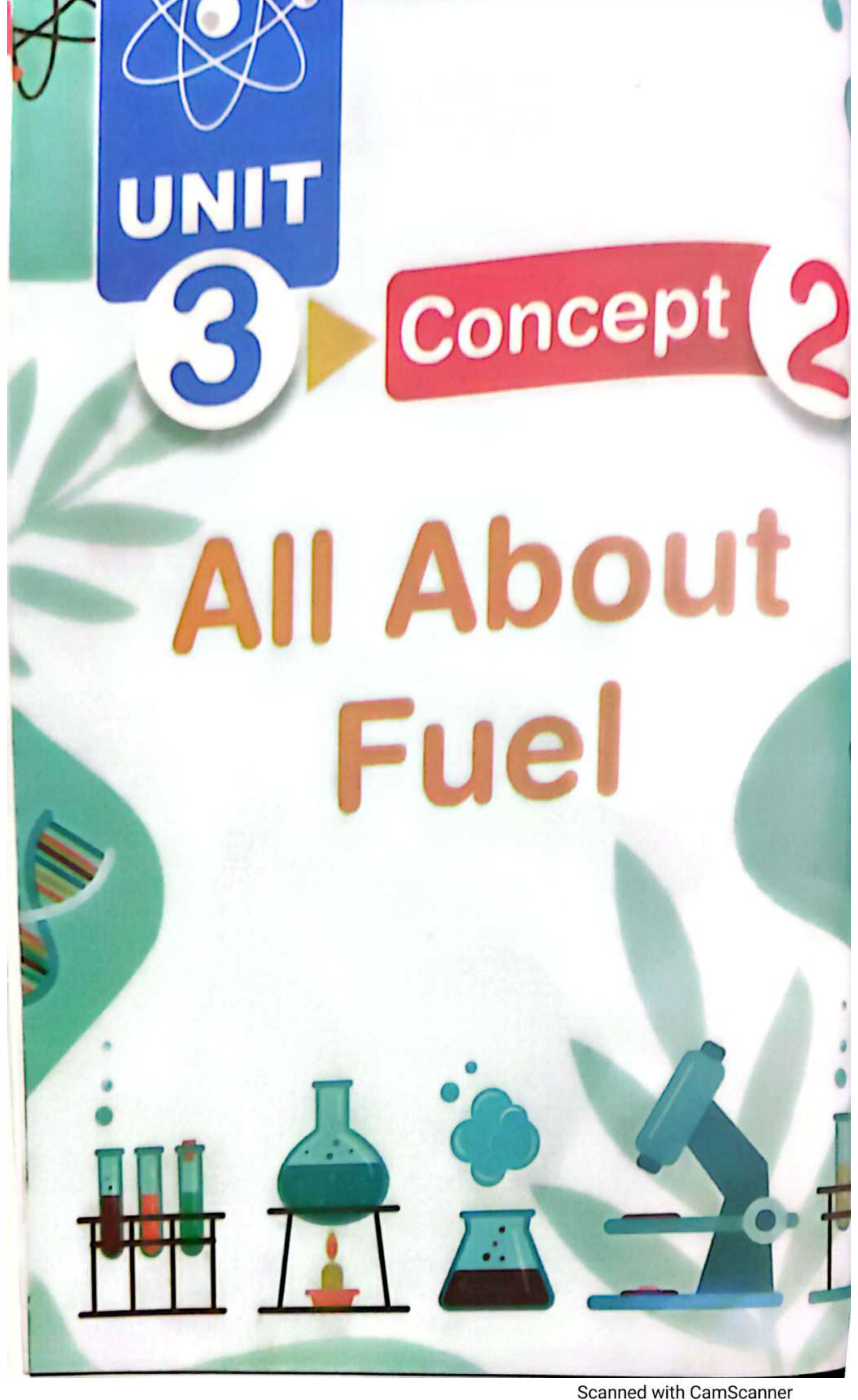
« الموبايل يستهلك طاقة كبيرة في وقت قصير.

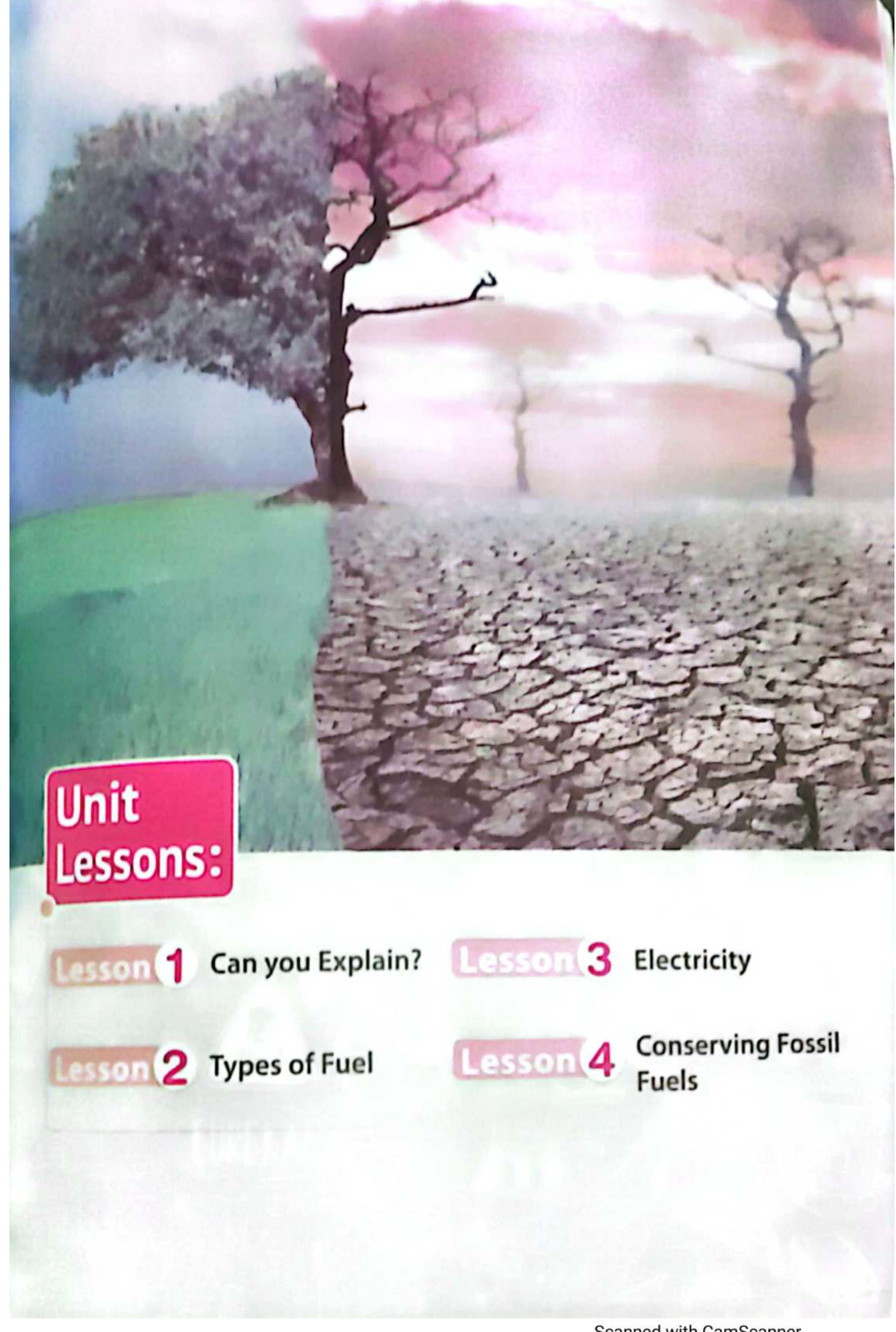


» They modify the battery to last for a longer time after charging it.

سؤال كيف استطاع المهندسون حل تلك المشكلة؟

« تطوير بطاريات الموبايل لتعمل لوقت أطول.


UNIT
3
Concept 2
All About
Fuel


Unit
Lessons:
Lesson 1 Can you Explain?
Lesson 2 Types of Fuel
Lesson 3 Electricity
Lesson 4 Conserving Fossil Fuels





Can you Explain?

- Any energy chain starts with ***the Sun***.
- The main source of fuel is ***the Sun***.

تبدأ أى سلسلة طاقة بالشمس، تُعتبر الشمس المصدر الرئيسي للوقود.

Examples of Fossil Fuel: أمثلة للوقود الحفرى



Source of Fossil Fuel: – مصدر الوقود الحفرى

- Fossil fuels are extracted from ***underground***.

يستخرج الوقود الحفرى من باطن الأرض.







Importance of Fossil Fuel: أهمية الوقود الحفرى



- Cars need .... to move. (food - *fuel* - water)

How a Car is Operated: كيف تعمل السيارة؟

- Fuel burns inside the car engine.
- يحترق الوقود داخل محرك السيارة.
- The car engine rotates the wheels of the car.
- يتمكن المحرك من تدوير عجلات السيارة.

If the fuel runs out, the car stops moving.

عندما ينفد الوقود، تتوقف السيارة عن الحركة.





1 Complete the following:

1. The main source of fuel is the ....
2. The fossil fuel is extracted from ....
3. ...., ... and .... are examples of fossil fuel.
4. When the fuel burns inside the car, the car ....
5. When the fuel runs out, the car ....
6. A car needs .... to move.

2 Correct the underlined words:

1. Any energy chain **ends** with the Sun. (..............................)
2. If the fuel **burns** inside the car engine, the car will stop. (..............................)
3. Fossil fuels are extracted from **mountains**. (..............................)
4. Cars need **food** to move. (..............................)



Types of Fuel

أنواع الوقود

- Burning fuel produces ***heat energy***.

حرق الوقود ينتج عنه طاقة حرارية.

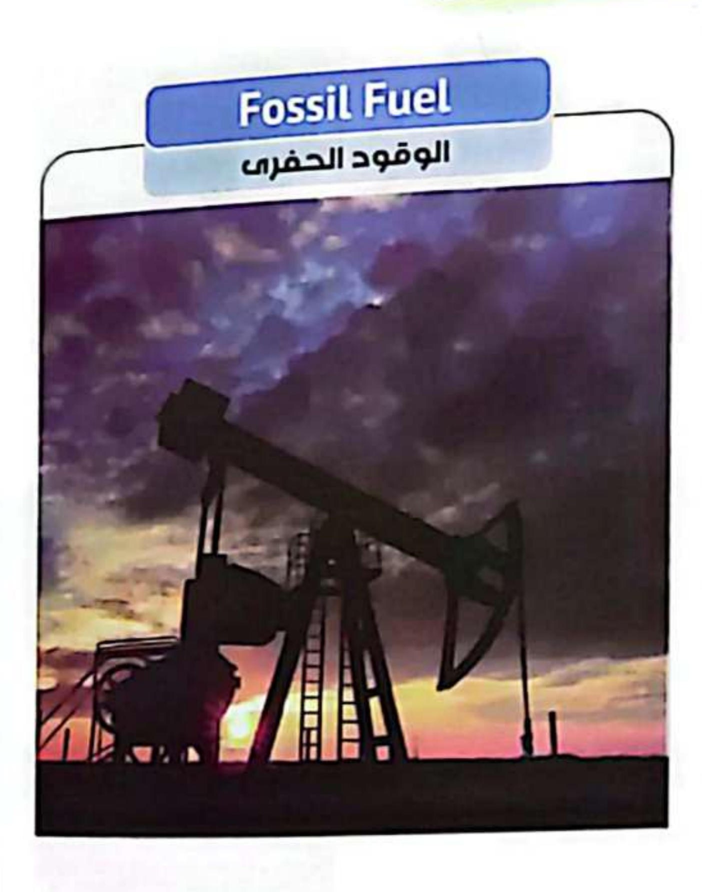
- ***Wood*** is the oldest fuel that is still used all over the world.

الخشب هو الوقود الأقدم الذى لا يزال يستخدم فى جميع أنحاء العالم.

Types of Fuel

Fossil Fuel

الوقود الحفرى



Biofuel

الوقود الحيوى



1 Biofuel الوقود الحيوي

» It is the fuel that is made from the living organisms that can be grown (planted).

« هو الوقود المصنوع من الكائنات الحية التى يمكن زراعتها.

» **Biofuel is a *renewable source of energy*.** GR

- ***Because it is renewed with the continuous growth of plants.***











» *Ethanol* (works as benzene) is made up of grass, corn or wood chips.

» *Charcoal* is made up of wood.



Disadvantage of Biofuel

» To get it, it requires:
cutting trees & *the removal of forests*.
So it has a negative effect on the environment.

« يتطلب الحصول عليه قطع الأشجار وإزالة الغابات وبالتالى له تأثير سلبى على البيئة.

Trees reach their full height in a period approaching the human life.

تصل الأشجار للارتفاع الكامل لها بعد عمر يقترب من عمر الإنسان.

2 Fossil Fuel الوقود الحفرى

- It is the fuel resulting from the decomposition of the living organisms remains that lived on the earth millions of years ago.

- هو الوقود الناتج من تحلل بقايا الكائنات الحية التى عاشت على الأرض منذ ملايين السنين.

- **Fossil fuel is a non-renewable source of energy.** GR
  - ***Because it starts to run out as soon as we use it, and the rate of our consumption exceeds the rate of its formation.***

- **لأنه يبدأ فى النفاد بمجرد استهلاكه لأن معدل استهلاكنا له يفوق معدل تكونه.**

Examples:



- ***Coal*** is produced from the decomposition of plants and trees remains.
- ***Petroleum & natural gas*** are produced from the decomposition of marine organisms and algae.

Advantages of Fossil Fuel:

Lighting houses



Warming houses



Cooking



Operating cars



Disadvantages of Fossil Fuel:

- The amount of it on Earth is limited.

- كميته محدودة على كوكب الأرض.

- Burning of fossil fuel produces gases that cause:

air pollution* & *global warming.

So it has a negative effect on the environment.

- حرق الوقود الحفرى يؤدى لانبعاث غازات تؤدى لتلوث الهواء وزيادة الاحتباس الحرارى.



Comparison between Fossil Fuel & Biofuel

Point of Comparison	Fossil Fuel	Biofuel
Definition	It is the fuel resulting from the decomposition of the living organisms remains that lived on the earth millions of years ago.	It is the fuel that is made from the living organisms that can be grown (planted).
Examples	1 Petroleum. 2 Natural Gas. 3 Benzene. 4 Coal.	1 Wood. 2 Grass. 3 Corn. 4 Wood Chips.
Advantages	1 Lighting houses. 2 Warming houses. 3 Cooking. 4 Operating cars.	It is a renewable source of energy.
Disadvantages	*It causes:* 1 Air pollution. 2 Global warming.	*To get it, it requires:* 1 Cutting trees. 2 Removal of forests.



1 Complete the following:

1. ………… , ………… and ………… are examples of fossil fuels.
2. ………… , ………… and ………… are examples of biofuels.
3. Burning of ………… causes air pollution and global warming
4. Biofuel is a ………… source of energy.
5. Coal is produced from the decomposition of ………… and ………… .
6. ………… is made up of grass, corn or wood chips.

2 What is meant by:

1. Fossil Fuel:

…………………………………………………………

…………………………………………………………

2. Biofuel:

…………………………………………………………

…………………………………………………………



Lesson 3 Electricity

الكهرباء

How Fossil Fuel is Formed
كيف يتكون الوقود الحفرى؟

» The old organism that lived millions of years ago dies.

« يموت الكائن الحى الذى عاش من ملايين السنين.

» These remains are buried under rocks and sediments.

« تدفن بقايا الكائن الحى تحت الصخور والرمال.

» Under the effect of the high temperature and pressure, these remains change into fossil fuel.

« تحت تأثير الحرارة والضغط العالى تتحول تلك البقايا إلى وقود حفرى.

Electricity:

1. Electricity is generated by burning ***petroleum*** or ***natural gas*** in ***electric power stations***.

« تتولد الطاقة الكهربية فى **محطات توليد الكهرباء** عن طريق **حرق الوقود**.



2. Countries started using renewable energy resources, such as ***wind energy*** and ***hydroelectric energy***.

« بدأت الدول الاهتمــــام باستخدام مصـــادر الطاقة المتجددة مثل: **الطاقة الكهرومائية وطاقة الرياح**.



How is Electricity Generated?



- The petroleum or natural gas is burnt and it produces thermal energy

يحترق البترول أو الغاز الطبيعى وينتج عنه طاقة حرارية.

- Thermal (heat) energy is used to heat water and produce steam.

تقوم الطاقة الحرارية بتسخين الماء وتحويله لبخار.

- Steam starts to move turbines.

يبدأ البخار بتحريك التوربينات.

- A dynamo converts kinetic energy in turbines into electric energy.

يقوم الدينامو بتحويل الطاقة الحركية للتوربينات إلى طاقة كهربية.

- Electricity transfers through huge wires to cities.

تنتقل الطاقة الكهربية عبر الأسلاك إلى المدن.





Lesson 4 Conserving Fossil Fuels
الحفاظ على الوقود الحفري

Environmental Problems in Big Cities
المشكلات البيئية فى المدن الكبيرة

Reasons of the Increasing Pollution: أسباب زيادة التلوث

1. Increasing the amount of burning fuel in factories, cars and airplanes.
   زيادة كمية احتراق الوقود فى المصانع والسيارات والطائرات.



2. Mixing the pesticides used in farms with the running water of rivers.
   اختلاط المبيدات الحشرية المستخدمة فى المزارع مع مجرى مياه الأنهار.



3. Chemical materials used in factories cause air pollution & water pollution.
   المواد الكيميائية المستخدمة فى المصانع تؤدى لتلوث الماء والهواء.



Negative Effects of Air Pollution: أضرار تلوث الهواء

The exhausts of cars & factories cause:

1. Eye & lung irritation.
2. Damage of tissues of the respiratory system.

تسبب عوادم السيارات:

1. تهيج العينين والرئتين.
2. تلف أنسجة الجهاز التنفسى.



Pollution Resulting From Burning Fuel: التلوث الناتج عن حرق الوقود

» **Carbon dioxide gas resulting from burning fuel is considered the main reason of:**

1 Formation of acidic rains.
2 Global warming.

« يعتبر غاز ثانى أكسيد الكربون الناتج عند احتراق الوقود السبب الرئيسى لـ:

1 تكون الأمطار الحمضية.
2 الاحتباس الحرارى.

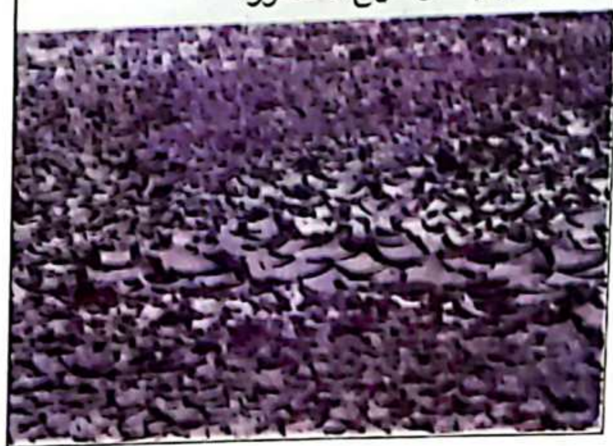
Acidic Rains
الأمطار الحمضية

- Carbon dioxide gas reacts with water vapour forming carbonic acid that causes acidic rains causing:

1 Death of trees.
2 Death of fish.
3 Chemical pollution of soil.
4 Decomposition of some rocks.

يتحد غاز ثانى أكسيد الكربون مع بخار الماء مكونًا حمض الكربونيك الذى يسبب:

1 موت الأشجار.
2 موت الأسماك.
3 التلوث الكيميائى للتربة.
4 تحلل بعض أنواع الصخور.



Global Warming
الاحتباس الحراري

- Carbon dioxide gas is collected and forms a layer in the atmosphere.

يتجمع غاز ثانى أكسيد الكربون مكونًا طبقة فى الغلاف الجوى.

- The heat is trapped in this layer, and the temperature of the earth rises slowly.

تحبس الحرارة فى تلك الطبقة مما يؤدى لزيادة درجة حرارة الأرض ببطء.



» **The amount of the fossil fuel on Earth is limited.** GR

« كمية الوقود الحفرى محدودة على كوكب الأرض.

- ***Because the rate of our consumption exceeds the rate of its formation through millions of years.***

- لأن معدل استهلاكنا له يفوق معدل تكونه عبر ملايين السنين.

How to Reduce the Burning of Fossil Fuel:

» Turning off electric bulbs and electric devices if we don't need them.

« إطفاء المصابيح والأجهزة فى حالة عدم الحاجة لها.

» Using public transportation.

« استخـدام وسـائل النـقـل العامة.

» Walking or driving a bike instead of driving cars.

« المشـى وركـوب الدراجات بدلًا من ركوب السيارات.







» The chemical structure of water and petroleum is ***different***.

« يختلف التركيب الكيميائى للماء عن الوقود.

Petroleum:

» Scientists believe that petroleum is formed from the decomposition of old marine organisms called ***diatom algae***.

« يعتقد العلماء أن سبب تكون البترول هو تحلل مخلوقات بحرية قديمة تسمى طحالب الدياتوم.

Diatom Algae:

- They are very tiny organisms, smaller than the head of a pin.
- They fall to the bottom of the oceans after death.
- They are covered by layers of rocks and sediments.
- Over millions of years, these remains are transformed by high temperature and pressure into petroleum oil.



- هى كائنات دقيقة جدًا لا يزيد حجمها عن رأس الدبوس.
- تستقر بعد موتها فى قـاع المحيط، وتغطـى بطبقات من الصخور والرمال.
- تتحول تلك البقايا بفعل الضغط والحرارة إلى النفط.

Water:

- **Water is a renewable source of energy.** GR
  - ***Because it is available and hasn't been run out yet.***

How to Reduce the Water Consumption:

- We must use water carefully, don't waste it or pollute it.
  يجب علينا استخدام الماء بحرص وعدم اهداره أو تلويثه.
- Growing plants don't require large amounts of water.
  زراعة النباتات التى لا تحتاج إلى رى بكميات كبيرة.





1 Complete the following:

1. Petroleum oil is a .... source of energy.
2. Petroleum is formed from the decomposition of ....
3. The rate of our consumption of petroleum oil .... the rate of its formation through millions of years.

2 Put (✓) or (✗):

1. Water is a non-renewable source of energy. (   )
2. The chemical structure of water and petroleum is different. (   )
3. The amount of fossil fuel on Earth is limited. (   )
4. We must light up electric bulbs and electric devices if we don't need them. (   )

3 How do we reduce burning of fossil fuel?

....

....

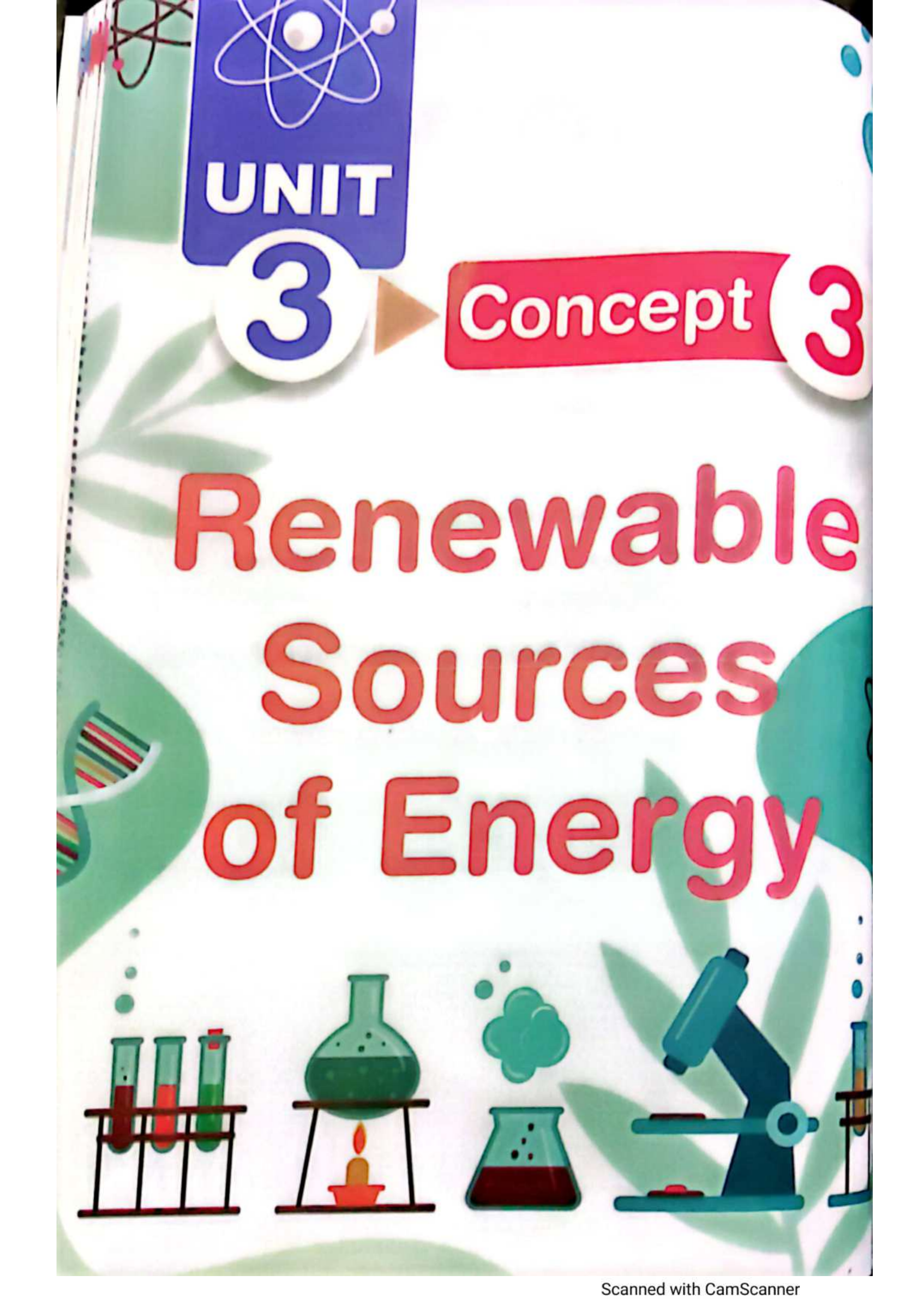
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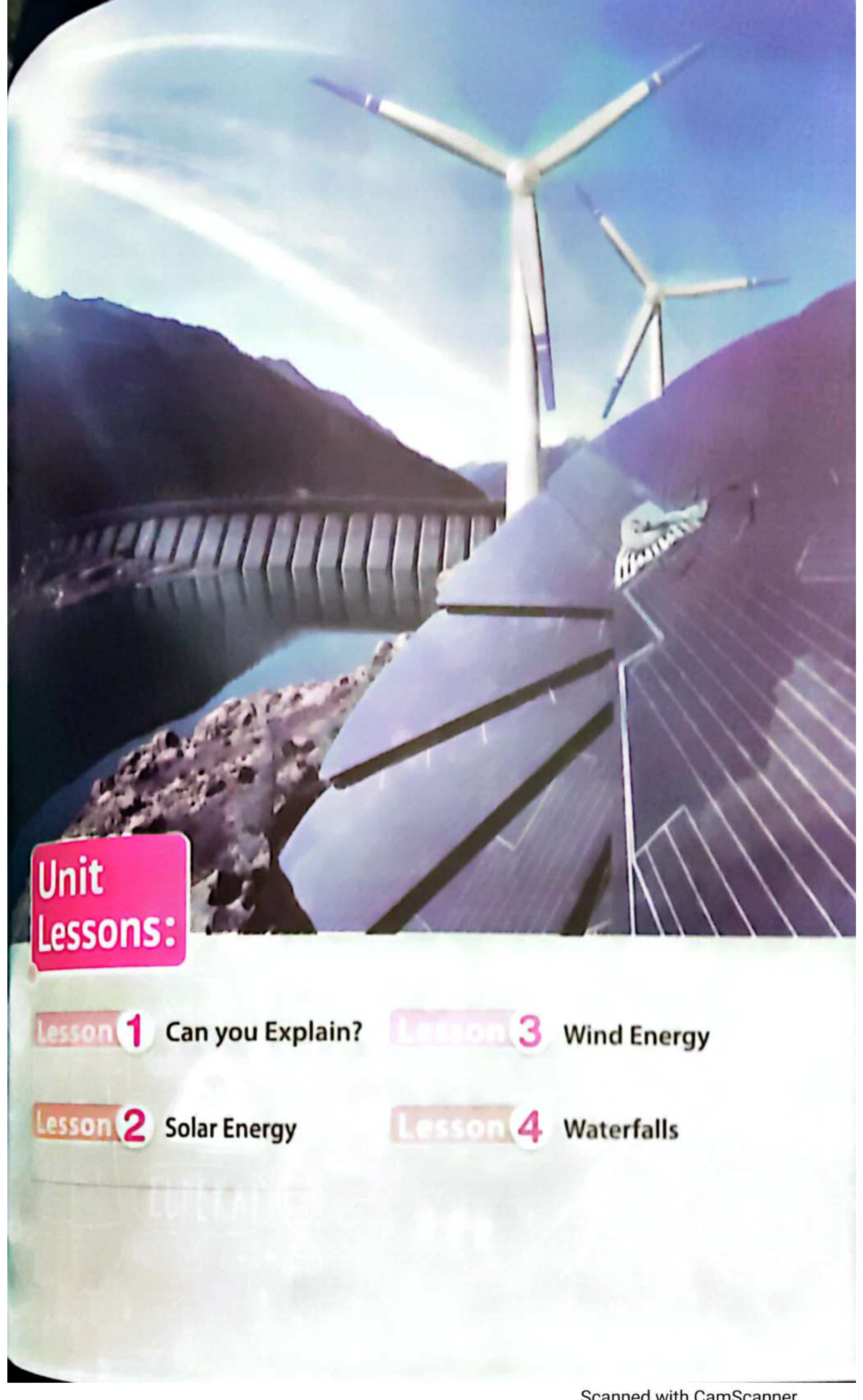
4 How do we reduce consumption of water?

....

....

....


UNIT
3
Concept 3
Renewable Sources of Energy



Unit Lessons:

- Lesson 1 Can you Explain?
- Lesson 2 Solar Energy
- Lesson 3 Wind Energy
- Lesson 4 Waterfalls



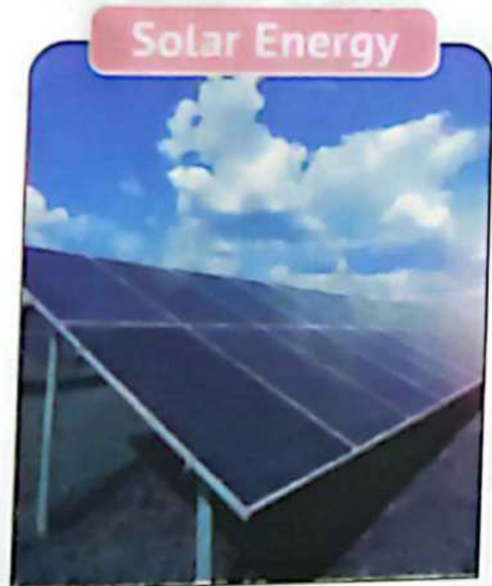
Can you Explain? هل تستطيع الشرح؟

Renewable Sources of Energy: مصادر الطاقة المتجددة

- The energy that will not run out faster than us consuming it.

هى الطاقة التى لن تنفد بصورة أسرع من استهلاكنا لها.









Importance: **They are used to generate *electricity*.**

- People use *machines*. GR
  - ***To make their life easier and get tasks done faster.***



Solar Panels: الألواح الشمسية



- They are used to light up street bulbs in cities.

Windmill

- Wind moves the windmill blades.

تحرك الرياح شفرات الطاحونة الهوائية



- The internal parts of a mill move and grind grains.

تتحرك الأجزاء الداخلية للطاحونة الهوائية وتطحن الحبوب لصناعة الخبز.

Watermill

- Water moves the watermill blades.

تحرك الرياح شفرات الطاحونة المائية.



- Kinetic energy transfers to another windmill and it grinds grains.

تنتقل طاقة الحركة للطاحونة الهوائية فتطحن الحبوب.

- The number of blades in a modern windmill is ***less*** than the old windmills.

عدد شفرات الطاحونة الحديثة أقل من القديمة.

- A modern windmill is ***taller*** than an old windmill.

الطاحونة الحديثة أطول من الطاحونة القديمة.

Modern windmills are used in: Generating electricity

Old windmills are used in: Grinding grains

Importance: Low cost and they work without electricity.

- Any device needs a *source of energy* to be operated.
- The source of energy may be *renewable* or *non-renewable*.

Device	Figure	Source of Energy	Type
1 Flashlight		Battery	Non-renewable
2 Petroleum oven		Petroleum	Non-renewable
3 Gas oven		Natural gas	Non-renewable
4 Fireplace		Coal	Non-renewable
5 Electric heater		Electricity	Renewable
6 Solar heater		Solar	Renewable





1 Fill in the gaps using the following words:

(grains – taller – shorter – more – less – solar oven – electric oven – gas oven – petroleum oven)

1. .... and .... depend on renewable sources of energy.
2. .... and .... depend on non-renewable sources of energy.
3. The number of blades in a modern windmill is .... than the old windmills.
4. A modern windmill is .... than an old windmill.
5. Windmills are used to grind ....

2 What is meant by:

- Renewable Sources of Energy:

....

....

3 Complete the following table:

Device	Energy Source	Energy Source Type
Flashlight	....	....
Fireplace	....	....
Electric heater	....	....
Solar heater	....	....

Lesson 2 Solar Energy
الطاقة الشمسية

The Sun:

Structure of the Sun
تركيب الشمس

- Sun surface *isn't solid* as the Moon.

سطح الشمس ليس صلبًا مثل سطح القمر.

- Sun consists of different gases, such as *hydrogen* and *helium*.

تحتوى الشمس على العديد من الغازات كالهيدروجين والهيليوم.

- The surface of the Sun is called *"photosphere"*.

يطلق على سطح الشمس «الغلاف الضوئى».

Photosphere: الغلاف الضوئى للشمس

- It is a gas region at the edge of the Sun that emits light and heat.

هى منطقة الغازات الموجودة على سطح الشمس والتى ينبعث منها الضوء والحرارة.



Importance of the Sun:

1. Sun provides us with *light* and *heat*.
2. Plants need sunlight to grow.



What will happen when:



1 Absence of the Sun (without Sun).

1. Plants will wither and die.
2. Animals that feed on plants will die.
3. Life disappears on the earth.

» تذبل النباتات وتموت.
» تموت الحيوانات التى تتغذى على النباتات.
» تختفى الحياة على الأرض.



2 If you look directly to the sun for a long time.

» Your eyes will be damaged.

» إذا نظرت للشمس لفترة طويلة فقد تتضرر عيناك.

How does the Sun produce heat energy?
كيف تنتج الشمس طاقة حرارية؟

» Sun is a star that consists of different gases, such as *hydrogen* and *helium*.

» الشمس نجم يحتوى على العديد من الغازات كالهيدروجين والهيليوم.

» When hydrogen reacts with helium, a great amount of energy is produced.

» عندما يتفاعل غازا الهيدروجين والهيليوم ينتج منهما طاقة عالية.

» Heat and light energies transfer through space in the form of waves to reach Earth.

» تنتقل الطاقة الحرارية والضوئية من الفضاء للأرض على شكل موجات.

Sunrays are called radiant energy (radioactivity).

يطلق على أشعة الشمس: الاشعاع أو الطاقة الاشعاعية

» **We feel the warmth of the sun at night.** 

- ***Because the atmosphere envelope, water and soil absorb heat energy from the sun.***

« نشعر بدفء الشمس خلال الليل.

- لأن الغلاف الجوى والمياه والتربة يمتصون الحرارة من الشمس.



1 Complete the following:

1. Sun provides us with .... and .... energies.
2. Without the Sun, plants ....
3. Sunrays are called ....
4. The Sun consists of different gases, such as .... and ....
5. The surface of the Sun is called ....

2 What will happen when:

1. You look directly to the sun.

....

....

2. Absence of the Sun.

....

....

3 What is meant by:

- Photosphere: ....



Solar Energy الطاقة الشمسية

Solar Energy

It is the energy produced from the Sun.

Importance of Solar Energy:

1 Planting inside greenhouses. الزراعة فى الصوب الزراعية

Greenhouse: الصوبة الزراعية

It helps farmers in planting crops that need hot weather in winter.

تساعد المزارعين على زراعة محاصيل تحتاج مناخ دافئ في فصل الشتاء.



- It allows the sun rays to pass through it.
- The heat energy of the sun warms the internal part of the greenhouse.

- تسمح لأشعة الشمس بالمرور من خلالها.
- تعمل الطاقة الحرارية للشمس على تدفئة الجزء الداخلي من الصوبة.





2 Operating irrigation machines. تشغيل ماكينات الري







3 Warming houses. تدفئة المنازل

- By placing large windows on the walls that face the sun.
- بوضع نوافذ كبيرة على الحوائط المواجهة للشمس.

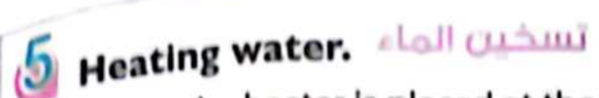




4 Cooking. الطهى

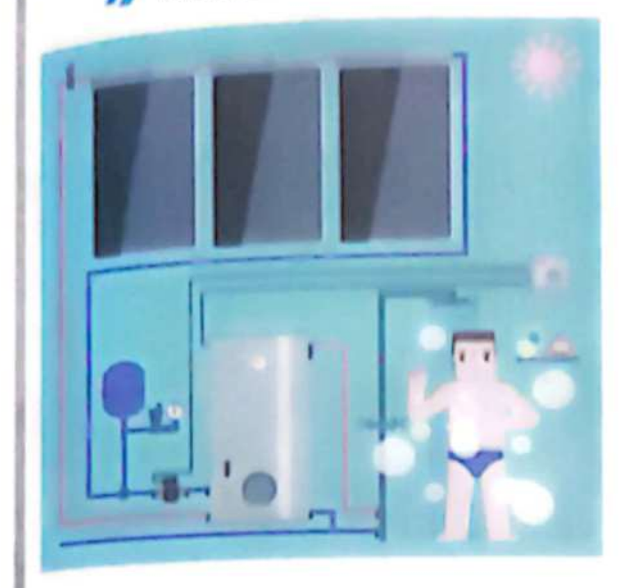
- Curved mirrors are used to direct the sunrays towards the cooking pans.
- تستخدم المرايــا المنحنية لتوجيه أشـعة الشــمس لأوانــى الطهى لطهى الطعام.

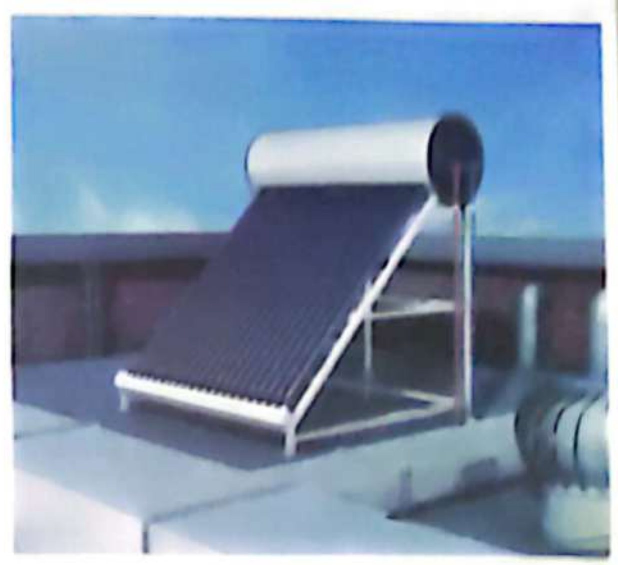




5 Heating water. تسخين الماء

- A solar heater is placed at the top of buildings.
- The water is heated when it passes through its tube.
- The hot water is stored in a hot water tank.





- توضع الألواح الشمسية على أسطح المنازل.
- يتم تسخين الماء من خلال مروره بتلك الأنابيب.
- يتم تخزين الماء في خزان ماء ساخن.

Solar Panels - الألواح الشمسية

Structure:

- A solar panel consists of a large number of small solar cells.

Idea:

- It changes ***solar*** energy into ***electric*** or ***heat*** energies.

Importance:

- It is used in generating electricity for lighting houses & streets.
- It stores electric energy in the batteries.



Calculators:

- They consist of batteries provided by small solar cells.
- تتكون من بطاريات مزودة بخلايا شمسية صغيرة.



1 Complete the following:

1. .... is the energy produced from the Sun.
2. .... helps farmers in planting crops that need hot weat[her] in winter.
3. The output energies in solar panels are .... & ....
4. The input energy in calculators is ....
5. Solar panels consist of ....

2 What is meant by:

1. Solar Energy:

....

....

2. Solar Panels:

....

....

3. Greenhouse:

....

....



Lesson 3 Wind Energy

طاقة الرياح

» The Sun warms the Earth and the wind.

» تدفئ الشمس الكرة الأرضية و الرياح.

» Solar energy causes air movements and wind blowing.

» تتسبب الطاقة الشمسية فى حركة الهواء وهبوب الرياح.

» The wind rotates the blades of windmills.

» تقوم الرياح بتدوير شفرات الطواحين الهوائية.

» The dynamo changes kinetic energy into electric energy.

» يقوم الدينامو بتحويل الطاقة الحركية إلى طاقة كهربية.

» Electric energy transfers through huge wires towards cities to light houses and streets.

» تنتقل الكهرباء عن طريق أسلاك ضخمة إلى المدن لإنارة المنازل والشوارع.



Lighting houses and streets



How to Design an Effective Turbine:

كيف تصمم توربينًا فعالًا؟



- The blades of the windmill must be light, tall and curved.
- It is better to decrease the number of the blades of the turbine.
  For example: 3 blades are better than 4 blades.

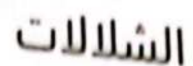
- لابد أن تكون شفرات التوربين خفيفة الوزن وطويلة ومنحنية.
- كلما قل عدد شفرات التوربين كانت كفاءته أفضل.



Put (✓) or (✗):

1. The wind rotates the blades of windmills. ( )
2. A dynamo changes electric energy into kinetic energy. ( )
3. It is better to increase the number of blades of a turbine. ( )
4. The blades of windmills must be light and short. ( )

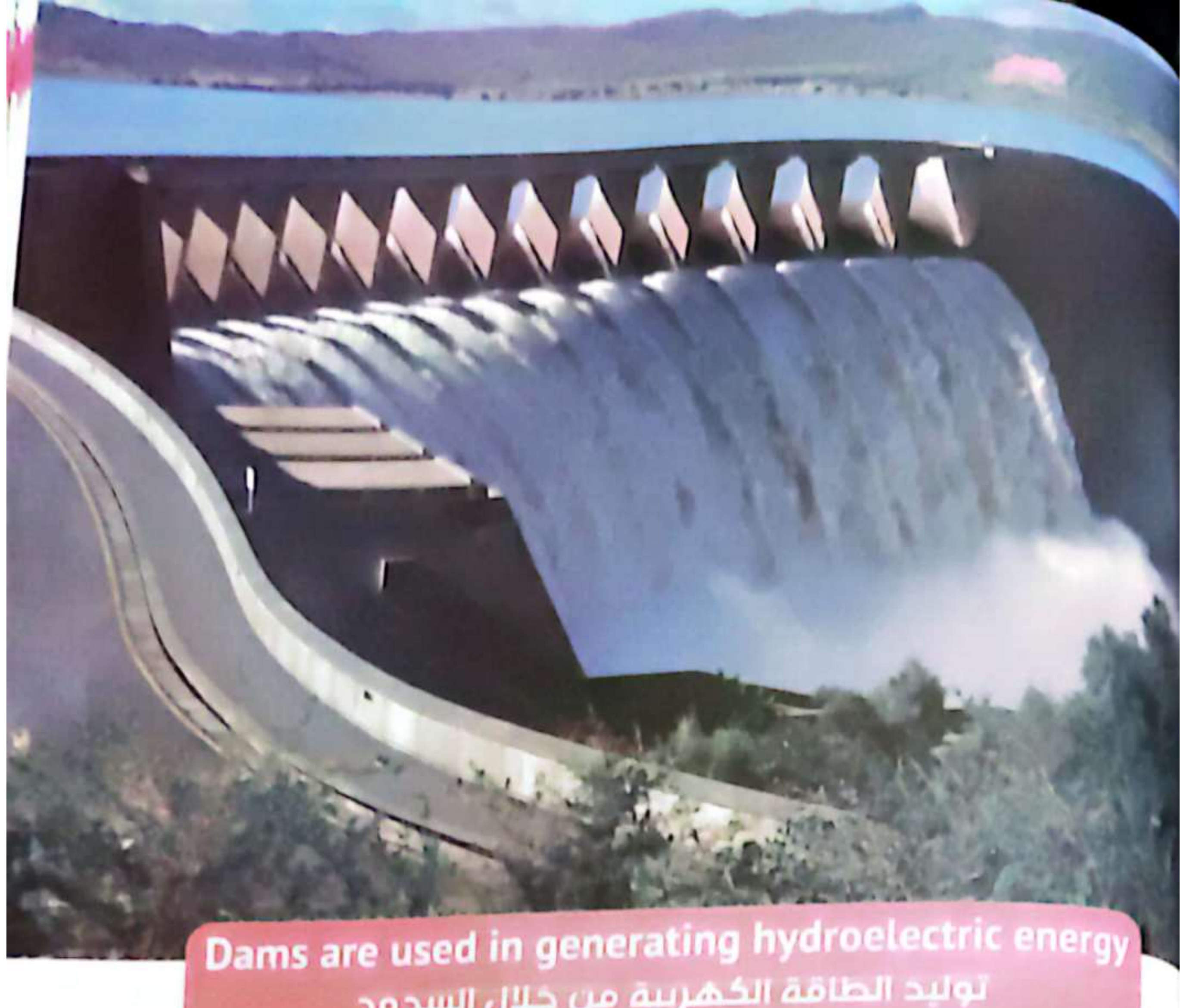




Lesson 4 Waterfalls

- **When the water of rivers falls from high slopes:**
  - ***Potential energy is converted into kinetic energy.***

- عند سقوط مياه الأنهار من أعلى المنحدرات:
  - تتحول طاقة الوضع المختزنة فى المياه إلى طاقة حركة.



Dams are used in generating hydroelectric energy
توليد الطاقة الكهربية من خلال السدود

- The dams stop the flow of water, which increases the gravitational potential energy.
  - يقوم السد بإيقاف سريان المياه مما يؤدى لزيادة طاقة الوضع المختزنة فى المياه.

- When water becomes free, it falls on the blades of the turbines, so they rotate.
  - عند السماح للمياه بالمرور خلال السد، تسقط المياه على شفرات التوربينات مما يؤدى لحركتها.

- The dynamo changes the kinetic energy of the turbines into electric energy.
  - يقوم الدينامو بتحويل طاقة حركة التوربينات إلى طاقة كهربية.

- Electricity transfers to cities through huge and long wires to light houses.
  - تنتقل الكهرباء للمدن عن طريق أسلاك عملاقة وطويلة وذلك لإنارة المنازل.

Generating Electricity — Using wind

Generating Electricity — Using waterfalls

Using wind:

Used in windy areas

تستخدم فى المناطق عاصفة الرياح

Both:

Generating Electricity

Clean Sources

Renewable sources

Using waterfalls:

Used in dams & rivers

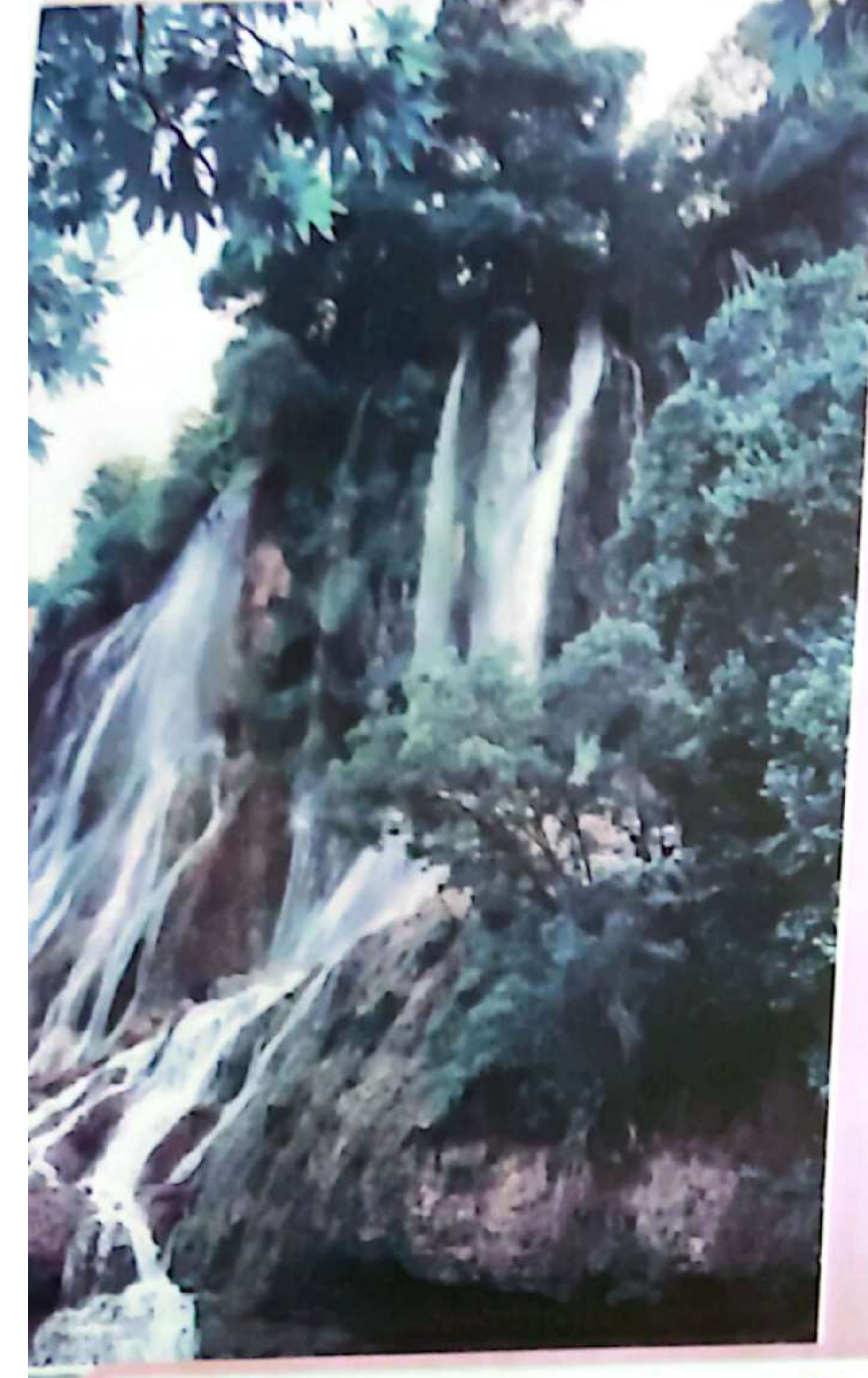
تستخدم فى الأنهار والسدود



Complete the following:

1. When water falls from a slope, its .... changes to ....
2. Dams increase the .... energy of water.
3. When water becomes free, it falls on ....
4. The dynamo changes the .... energy of the turbines into .... energy.

Project



Water as a Source of Energy

- The great amount of water running in rivers or falling from waterfalls can be used to move watermills to generate energy.

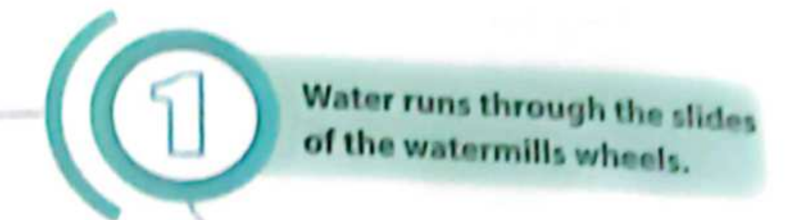
الكمية الهائلة من الماء المتدفق عبر الأنهار وأعلى الشلالات يمكن استخدامها لتحريك طواحين الماء وتوليد الطاقة.

Hydroelectric Energy الطاقة الكهرومائية

- **It is the force of moving water to rotate a huge turbine to generate electricity.**

- هى قوة تحريك المياه لتدوير توربين كبير لتوليد الكهرباء.

How it works:





3 Energy is produced and it is used to move devices.

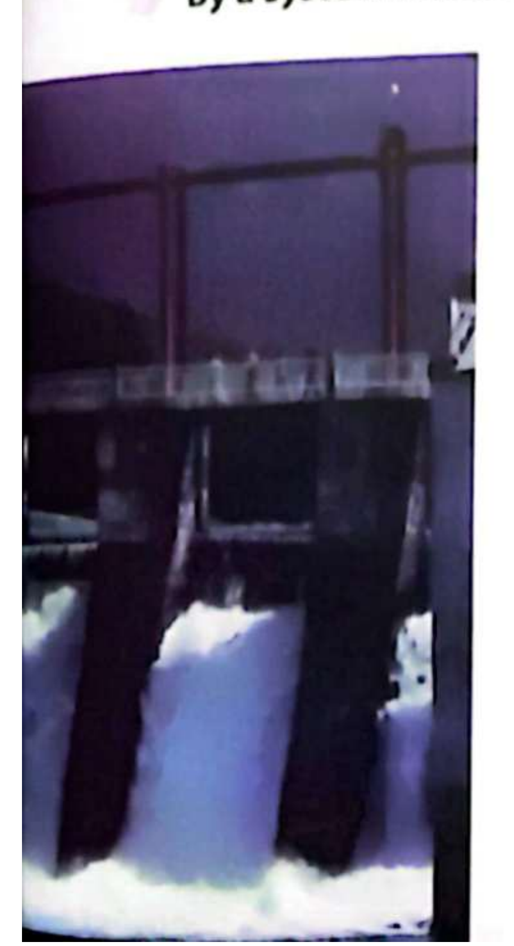
» يتدفق الماء من خلال الشرائح الموجودة على عجلة طواحين المياه فتدور العجلة وتنتج الطاقة التى تستخدم فى تحريك الآلات والمعدات.

Q How could scientists & engineers make use of the water force?

كيف استطاع العلماء والمهندسون تسخير قوة الماء؟

- By building *dams*.
- To make use of the running water.
- By a system which stores the energy of the moving water.

» عن طريق بناء السدود لتسخير تدفق مياه الأنهار خلال نظام يخزن المياه المتحركة.



Advantage of Dams

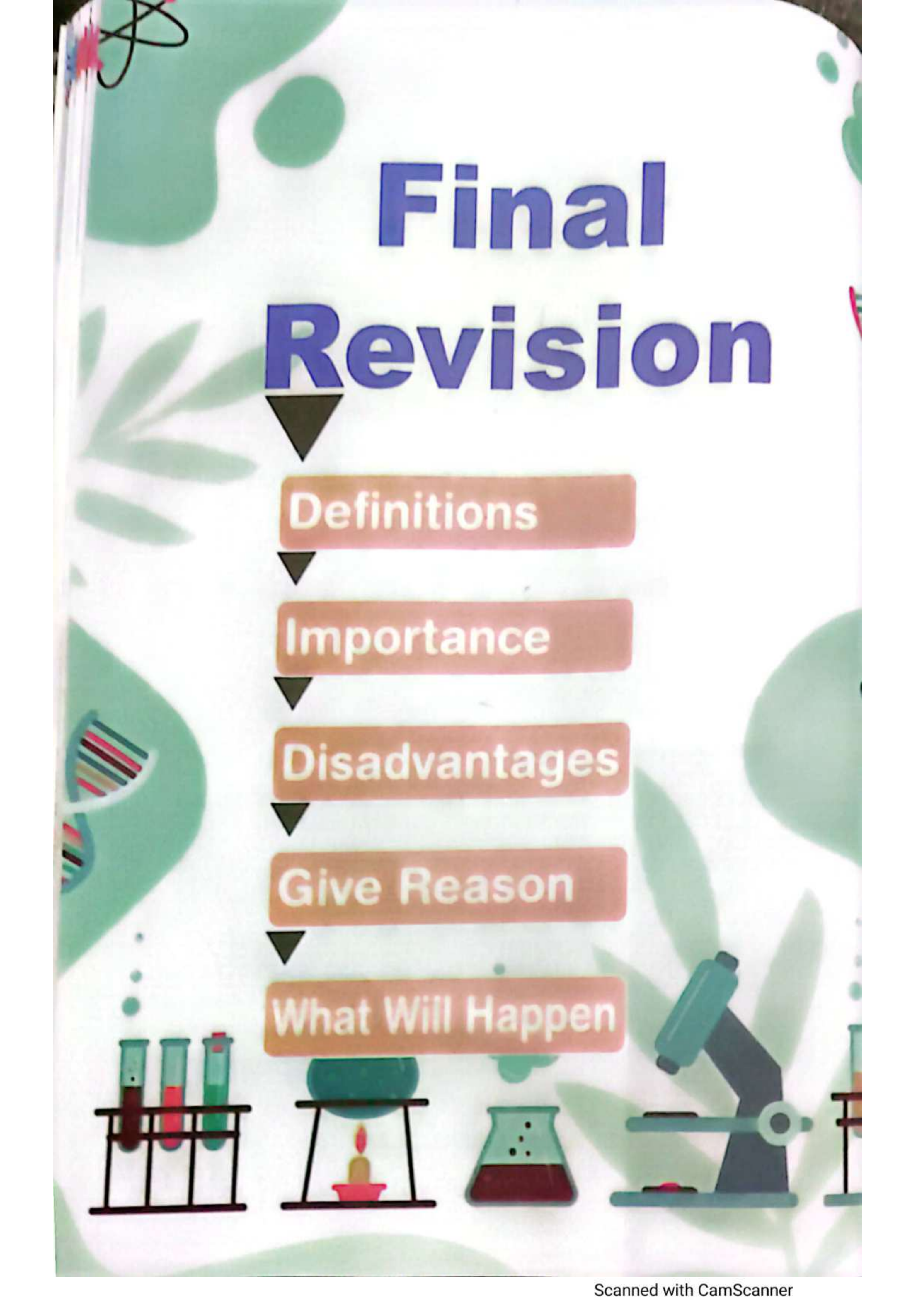
Dams can generate clean energy.

تولد السدود الكثير من الطاقة النظيفة.

Disadvantage of Dams

Dams affect the ecosystem when the water path changes.

تؤثر فى النظام البيئى وذلك لتغير مسار المياه.


Final
Revision
Definitions
Importance
Disadvantages
Give Reason
What Will Happen

Definitions

Unit 2 Concept 3 Lesson 6

Fuel-powered cars	They are cars that need gas stations and cause climate changes.
Electric cars	They are cars that have batteries that need to be charged.
Solar cars	They are cars operated by solar energy and they don't need fuel or electricity.

Unit 2 Concept 4

Wrecking ball	It is a heavy steel ball swinging on a cable and it is used to knock down parts of buildings.
Seatbelt	A safety equipment in cars which is used to keep the driver body from moving forward during collision.
Airbag	A safety equipment in cars that absorbs the energy of the car during collision.
Collision	It is the moment of the crash of two objects together.
Electric lamp	A device used to light houses and it changes the electric energy into light and heat energies.
Electric iron	A device used to iron clothes and it changes electric energy into heat energy.

Electric heater	A device used in warming houses and it changes the electric energy into heat energy.
Cellular phone	A device used to make calls and it changes electric energy into sound and light energies.
Radio	A device that changes electric energy into sound energy.
TV	A device used to transfer sound and image and it changes electric energy into light and sound energies.
Solar cell	A device that changes solar energy into electric energy.
Solar heater	A device that changes solar energy into heat energy.
Hair dryer	A device used for drying the hair and it changes electric energy into heat, kinetic and sound energies.
Washing machine	A device used to wash clothes and it changes electric energy into kinetic energy.
Motor engine	A device used to move things and it changes the electric energy into kinetic energy.
Dynamo	A device used to generate electricity and it changes the kinetic energy into electric energy.
Bike	A device used for transporting and it changes the chemical energy inside the human body into kinetic energy.
Fan	A device used for moving air and it changes the electric energy into kinetic energy.

Small watch	A device used for knowing time and it changes the chemical energy into kinetic energy.
Law of Conservation of Energy	Energy is neither created nor destroyed but it changes from one form to another.
Ecologist	They check the flow of energy through food networks in the ecosystem.
Engineers	They design solutions for problems, such as how the mobile screen obtains the light energy.
Biofuel	It is the fuel that is made from the living organisms that can be grown (planted).
Fossil fuel	It is the fuel resulting from the decomposition of the living organisms remains that lived on the earth millions of years ago.
Diatom algae	They are very tiny organisms, smaller than the head of a pin and they were transformed by high temperature and pressure into petroleum oil.
Renewable source of energy	It is the energy that will not run out faster than us consuming it.
Non-renewable source of energy	It is the energy that will run out faster than us consuming it.
Photosphere	It is a gas region at the edge of the Sun that emits light and heat.

Solar energy	It is the energy produced from the sun.
Greenhouse	It helps farmers in planting crops that need hot weather in winter.
Solar panels	They consist of a large number of small solar cells. It changes solar energy into electric or heat energies.
Hydroelectric energy	It is the force of moving water to rotate a huge turbine to generate electricity.

Importance

Unit 2 Concept 3 Lesson 6

Fuel-powered cars	The amount of energy produced by the fuel is high.
Electric cars	They don't cause climate changes.
Solar cars	They don't need fuel or electricity. They don't cause climate changes. They are light in weight.

Unit 2 Concept 4

Wrecking ball	It is used to knock down parts of buildings.
Seatbelt	It is used to keep the driver body from moving forward during collision.
Airbag	**1.** It slows the speed of the driver when his body moves forward. **2.** It absorbs the energy of the car during collision.



Unit 3 Concept 1

Curiosity Robot	One of the most famous robots that used to explore mars
Hair dryer	It is used for drying the hair.
Washing machine	It is used for washing clothes.
Electric bulb (lamp)	It is used to light up houses.
Dynamo	It is used to operate electricity.
Motor	It is used to move things.
Mobile phone	It is used to make calls.
Electric iron	It is used to iron clothes.
TV	It is used to transfer sound and image
Fan	It is used for moving the air.
Small watch	It is used for knowing time.

Unit 3 Concept 2

Fossil fuel	Lighting houses, warming clothes, cooking and operating cars.
Biofuel	It is a renewable source of energy
Fuel	It is used to operate cars.
Grass, corn and wood chips	They are used to produce ethanol.

Wood	It is used to produce charcoal.
Diatom algae	Over millions of years, these remains are transformed by high temperature and pressure into petroleum oil.

Unit 3 Concept 3

Machines	To make human life easier and get tasks done faster.
Solar panels	1. They are used in generating electricity for lighting houses. 2. They store electric energy in the batteries.
Windmill	The internal parts of a mill move and grind grains.
Photosphere	It emits light and heat.
Sun	1. Sun provides us with light and heat. 2. Plants need sunlight to grow up.
Solar energy	1. Planting inside greenhouse. 2. Operating irrigation machines. 3. Warming houses. 4. Cooking. 5. Heating water.
Dams	They can generate clean energy.
Hydroelectric energy	It is the force of the moving water to rotate a huge turbine to generate electricity.

Disadvantages

Unit 2

Fuel-powered cars	They cause climate changes.
Electric cars	They have batteries that must be charged.
Solar cars	The amount of energy it gets from the sun is smaller than what we get from gasoline or electricity.

Unit 3

Fossil fuel	*It causes:* **1.** Air pollution. **2.** Global warming.
Biofuel	*To get it, it requires:* **1.** Cutting trees. **2.** Removal of forests.
Dams	They affect the ecosystem when the water path changes.

Give Reason

1. **Fuel-powered cars have some disadvantages.**
   - Because they cause air pollution and climate changes.

2. **Electric cars have some disadvantages.**
   - Because they have batteries that must be charged.

3. **Solar cars have some disadvantages.**
   - The amount of energy a solar car gets from the sun is less than what we get from gasoline or electricity.

4. **Mechanical engineers designed solar vehicles that are light in weight.**
   - To make these vehicles consume less amount of energy

5. **During collision, a truck causes more damage to the car.**
   - Because the truck is a heavy object that has more energy than the car.

6. **During collision, a fast car causes more damage to the slow car.**
   - Because the fast car has more energy than the slow car.

7. **Construction workers use a wrecking ball.**
   - To knock down parts of buildings.

8. **If the player uses a bat to hit the tennis ball, the speed of the ball will increase in different directions.**
   - Because the energy transfers from the bat to the tennis ball.

9. **Modern cars are provided with a seat belt.**
   - To keep the driver's body from moving forward during collision.



10. <u>Modern cars are provided with an airbag.</u>

    1. It slows the speed of the driver when his body moves forward.
    2. It absorbs the energy of the car during collision.

11. <u>When a boy runs fast and hits a traffic sign, he stops moving and the traffic sign vibrates.</u>

    - Because the kinetic energy transfers from the boy to the traffic sign. So, the traffic sign may vibrate.

12. <u>During collision between two moving objects, we hear the sound of crashing.</u>

    - A part of the kinetic energy changes to sound energy during collision.

13. <u>A crash investigator uses all scientific laws of motion, force & energy.</u>

    - To solve the puzzle of the collision between two objects.

14. <u>A crash investigator asks the two drivers about the collision.</u>

    - To know who caused the accident.

15. <u>A crash investigator uses photos & videos.</u>

    - To collect all the needed information about the accident.

16. <u>A spacecraft needs more than 6 months to arrive on Mars.</u>

    - Because the distance between Earth & Mars is 54 millions km.

17. <u>Humans send robots which are operated by remote controls to Mars.</u>

    - To explore Mars.

18. <u>It is difficult to obtain electricity to operate a robot.</u>

    1. The robot is very far from any plug, electric charge or markets.
    2. It is impossible to connect the charger to the rocket plugs.

19. Any energy chain starts with the Sun.
    - Because the Sun is the main source of energy.

20. Energy is saved.
    - Energy is neither created nor destroyed but it changes from one form to another.

21. When you touch an electric lamp, you feel hot.
    - Because electric energy changes into light and heat energies.

22. Ecologists check the flow of energy through food networks in the ecosystem.
    - Because any change in the flow of energy affects living organisms.

23. Biofuel is a renewable source of energy.
    - Because it is renewed with the continuous growth of plants.

24. Biofuel has a negative effect on the environment.
    - To get it, it requires cutting trees & the removal of forests.

25. Fossil fuel is a non-renewable source of energy.
    - Because it starts to run out as soon as we use it. Also, the rate of our consumption exceeds the rate of its formation.

26. The amount of fossil fuel on the earth is limited.
    - Because the rate of our consumption exceeds the rate of its formation through millions of years.

27. Fossil fuel has a negative effect on the environment.
    - Burning the fossil fuel produces gases that cause air pollution & global warming.

28. Walking or driving a bike is better than driving cars.
    - To reduce the amount of burning fossil fuel.

29. Water is a renewable source of energy.
    - Because it is available and hasn't been run out yet.

30. We must use water carefully, don't waste it or pollute it.
    - To reduce the consumption of water.

31. Solar energy is a renewable source of energy.
    - Because solar energy is the energy that will not run out faster than consuming it.

32. People use machines.
    - To make their life easier and get tasks done faster.

33. Sun surface isn't solid as the Moon.
    - Because the Sun consists of different gases, such as hydrogen and helium.

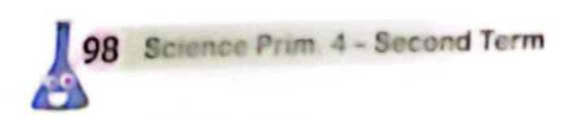
34. Sun is very important for all the living organisms.
    1. Sun provides us with light and heat.
    2. Plants need sunlight to grow up.

35. We feel the warmth of the sun at night.
    - Because the atmosphere envelope, water and soil absorb heat energy from the sun.

36. Greenhouse help farmers in the agricultural field.
    - Because it helps farmers in planting crops that need hot weather in winter.

37. Placing large windows on the wall that faces the sun.
    - For warming houses.

38. Curved mirrors are used in solar ovens.
    - To direct the sunrays towards the cooking pans to cook food faster.



39. Solar heater is placed at the top of buildings.

- To heat the water when it passes through its tube, then it is stored in a hot water tank

40. Solar panels are used in generating electricity for lighting houses & streets.

- Because they change solar energy into electric or heat energies.

41. Sun is the main source in generating electricity by wind energy

- Because the sun warms the earth and the wind. So, solar energy causes air movements and wind blowing and the wind rotates the blades of the windmill.

42. Dams are used in generating hydroelectric energy

- The dams stop the flow of water which increases the gravitational potential energy.

What Will Happen

1. Mechanical engineers designed solar vehicles that are heavy in weight.
   - They will consume a high amount of energy.
2. A truck hits a car.
   - The truck will cause more damage to the car because the energy of collision transfers from the truck to the car.
3. A fast car hits a slow car.
   - The fast car will cause more damage to the slow car because the energy of collision transfers from the fast car to the slow car.
4. The player uses a bat to hit the tennis ball.
   - The speed of the ball will increase in different directions.
5. During and after collision (concerning the airbag).
   - During collision: The air bag inflates automatically.

   After collision: The air bag deflates fast, so the driver can get out of the car
6. Two cars collide together.

   a. Energy transfer occurs. b. Energy changes occur.
7. When a boy runs fast and hits a traffic sign.
   - The boy stops moving forward and he may get injured and the traffic sign may vibrate.
8. Two cars moving in the same direction collide together.
   - Damage will be less severe.

9. Two cars moving in the opposite directions collide together.
   - Damage will be more severe.

10. If a bike moving with a high speed hits a person.
    - The person may get injured only and he/she will survive.

11. If a car moving with a high speed hits a person.
    - The person's life may be in danger.

12. The height (angle) of the ramp increases (concerning the moving object on it).
    - The speed of the moving object increases.

13. A big ball and a small ball sliding on a ramp.
    - The big ball falls faster than the small ball.

14. When the ball in Newton's cradle is raised up .
    - The ball stores potential energy and doesn't contain any kinetic energy.

15. When you leave the ball of Newton's cradle to fall.
    - The potential energy decreases gradually and is converted into kinetic energy.

16. When the ball of Newton's cradle hits the 1st ball next to it.
    - The kinetic energy is transferred to the next ball, then to the rest of the balls.

17. When batteries run out.
    - Devices stop, so we must charge it or exchange it.

18. On driving a bike.
    1. Chemical energy stored in the human body changes into kinetic energy.
    2. A part of the kinetic energy changes to heat energy due to the friction between the wheels of the bike and the road.



19. *Fuel burns inside the car engine.*
    - *The car engine rotates the wheels of the car.*

20. *Wind moves the windmill blades.*
    - *The internal parts of the mill move and grind the grains.*

21. *Water moves the watermill blades.*
    - *Kinetic energy transfers to another windmill and grind the grains.*

22. *Absence of the Sun (Without the Sun).*
    1. *Plants will wither and die.*
    2. *Animals that feed on plants will die.*
    3. *Life disappears on the earth.*

23. *If you look directly to the sun for a long time.*
    - *Your eyes will be damaged.*

24. *When the water of rivers falls from high slopes.*
    - *Potential energy is converted into kinetic energy.*

Contents



Choose the correct answer:

1. An electric lamp changes electric energy into .... energy.
   a. sound energy
   b. light energy
   c. kinetic energy
   d. solar energy
2. The .... changes electric energy into heat energy.
   a. electric iron
   b. radio
   c. TV
   d. cellular phone
3. The .... changes electric energy into light and sound energies.
   a. cellular phone
   b. TV
   c. radio
   d. a & b
4. Sound energy is produced from all the following devices, except the ....
   a. cellular phone
   b. TV
   c. radio
   d. electric iron
5. Light energy is produced from all the following devices, except the ....
   a. cellular phone
   b. TV
   c. radio
   d. electric lamp
6. Solar cells change solar energy into ....
   a. electric energy
   b. heat energy
   c. sound energy
   d. kinetic energy

7. .... produce electric energy.
   - a. Electric irons
   - b. Electric heaters
   - c. Solar cells
   - d. Motors

8. .... consume electric energy.
   - a. Solar cells
   - b. Batteries
   - c. Solar heaters
   - d. Cellular phones

9. Heat energy is .... in the solar heater.
   - a. consumed
   - b. produced
   - c. lost
   - d. destroyed

10. Electric energy is .... in the electric heater.
    - a. consumed
    - b. produced
    - c. lost
    - d. destroyed

11. All these devices consume electric energy, except the ....
    - a. cellular phone
    - b. solar cell
    - c. radio
    - d. TV

12. The .... contains chemical energy.
    - a. solar heater
    - b. battery
    - c. radio
    - d. TV

13. Calculators can be operated by using ....
    - a. solar energy
    - b. electric energy
    - c. heat energy
    - d. sound energy

14. A gas oven can be operated by using ....
    - a. solar energy
    - b. electric energy
    - c. heat energy
    - d. natural gas

15. A/An .... is operated by electricity.
    - a. TV
    - b. electric heater
    - c. radio
    - d. all the following

16. The distance between Earth and Mars is .... million kilometers.
    a. 54 b. 55
    c. 44 d. 45

17. Curiosity is the most famous .... on Mars.
    a. application b. spacecraft
    c. robot d. rocket

18. Robots and vehicles are operated by ....
    a. electric chargers b. long-term batteries
    c. solar panels d. b & c

2 Put (✓) or (✗):

1. Energy can't be changed from one form to another. ( )
2. Electric lamps consume electric energy. ( )
3. Solar energy is the energy consumed in solar cells. ( )
4. TV and cellular phones produce light energy. ( )
5. TV and radios consume sound energy. ( )
6. Solar energy is converted into electric energy in solar cells. ( )
7. Batteries produce chemical energy. ( )
8. Calculators can be operated by using solar energy. ( )
9. Curiosity Robot is one of the most famous robots on Mars. ( )
10. Robots obtain electricity from solar panels and electric chargers. ( )



3 Fill in the gaps using the following words:

(electric – heat – chemical – consumed – produced – TV – Solar cells)

1. .... produce electric energy.
2. The .... produces sound energy.
3. Solar energy is the energy .... in solar cells.
4. Electric energy is the energy .... in solar cells.
5. Electric irons consume .... energy and produce .... energy.
6. The devices contain batteries that contain .... energy.

4 Write the scientific term:

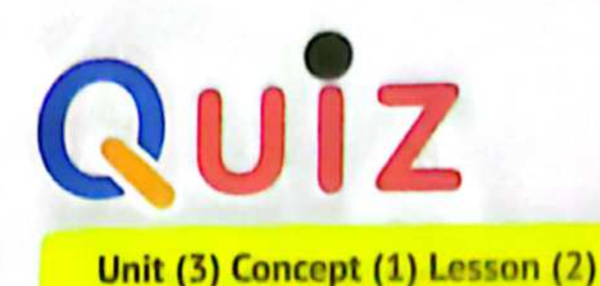
1. Energy produced from solar cells. (....................)
2. Energy consumed by solar heaters. (....................)
3. A device that changes electric energy into sound energy. (....................)
4. A device that changes electric energy into heat energy. (....................)
5. A device that changes solar energy into electric energy. (....................)
6. A device that changes solar energy into heat energy. (....................)
7. They contain chemical energy that changes to electric energy. (....................)

5 Complete the following:

1. ……………, …………… and …………… produce sound energy.
2. ……………, …………… and …………… produce light energy.
3. Electric energy is …………… in cellular phones while it is …………… in solar cells.
4. …………… change solar energy into electric energy.
5. Cellular phones change …………… energy into …………… and …………… energies.
6. …………… change chemical energy into electric energy.
7. Spacecrafts needs more than …………… months to reach Mars.
8. Vehicles on Mars change solar energy into ……………, …………… and …………… energies to operate their …………… to move on Mars.
9. Robots are very far away from any …………… and …………… .
10. Devices use …………… as a source of energy.

6 Classify the following devices according to devices need for solar energy or electric energy:

Devices that need solar energy	Devices that need electric energy
……………………	……………………
……………………	……………………



Unit (3) Concept (1) Lesson (2)

1 Choose the correct answer:

1. Energy is very important for most devices to ....
   - a. operate
   - b. do their functions
   - c. move
   - d. all the following
2. When batteries run out, devices ....
   - a. operate
   - b. move
   - c. stop
   - d. do their functions
3. Batteries store .... energy to operate devices.
   - a. electric
   - b. chemical
   - c. heat
   - d. kinetic
4. To make batteries work again, we must ....
   - a. charge it
   - b. change it
   - c. burn it
   - d. a & b
5. The main source of energy in all devices is the ....
   - a. Sun
   - b. wind
   - c. water falls
   - d. coal
6. Any energy chain .... with the Sun.
   - a. ends
   - b. stops
   - c. starts
   - d. no correct answer
7. During running, ... energy stored in food changes to kinetic energy.
   - a. electric
   - b. heat
   - c. chemical
   - d. sound



8. We burn trees to get .... energy.

a. heat
b. electric
c. chemical
d. sound

9. A hair dryer changes electric energy into .... energy.

a. kinetic
b. sound
c. heat
d. all the following

10. .... is used in electric power stations to produce electricity.

a. Food
b. Coal
c. Water
d. No correct answer

11. The input energy in mobile phones is (are) ....

a. electric
b. sound
c. light
d. b & c

12. It is .... to operate any device without the Sun.

a. possible
b. impossible
c. acceptable
d. no correct answer

13. When you rub your hands, kinetic energy changes to .... energy.

a. light
b. sound
c. heat
d. electric

14. The .... is used to move things.

a. dynamo
b. motor
c. hair dryer
d. electric heater

15. The .... is used to obtain electricity.

a. dynamo
b. motor
c. hair dryer
d. electric heater

16. Driving a bike changes the .... energy inside the human body into kinetic energy.
   a. heat
   b. chemical
   c. potential
   d. kinetic
17. .... change electric energy into kinetic energy.
   a. Fans
   b. Motors
   c. Washing machines
   d. All the following
18. Motors .... electric energy.
   a. consume
   b. produce
   c. lose
   d. no correct answer
19. Heat energy is .... in the electric iron.
   a. consumed
   b. resulting
   c. lost
   d. destroyed
20. Toy cars change .... energy into kinetic energy.
   a. sound
   b. heat
   c. elastic potential
   d. electric

2 Put (✓) or (✗):

1. Any energy chain starts with the Sun. (   )
2. When a battery runs out, we must charge it. (   )
3. Batteries store electric energy. (   )
4. During running, chemical energy changes to kinetic energy. (   )
5. A hair dryer changes electric energy into heat energy only. (   )
6. Coal is used in electric power stations to get electricity. (   )
7. Small watches are used to know time. (   )

8. Kinetic energy is produced in motors. ( )
9. Heat energy is resulted from dynamos. ( )
10. Small watches consume heat energy. ( )

3 Write the scientific term:

1. It is the energy stored in batteries. ( )
2. The main source of energy. ( )
3. The output energy in the electric iron. ( )
4. The output energy in the small watch. (..........)
5. A device used to move things. (..........)
6. A device used to get electricity. (..........)
7. A device used to light houses. (..........)
8. A device used for drying hair. (..........)
9. A device used to transfer image and sound. (..........)

4 Complete the following:

1. Energy makes devices .... and ....
2. Batteries store .... energy that is used to operate ....
3. When batteries run out, we must .... or .... them.
4. During running, the .... energy stored in the human body changes to .... energy.
5. .... is used in electric power stations to produce electricity.
6. Any energy chain starts with the ....

6 Arrange the following energy chains from the start to the end:

1 During running:


Chemical energy


Kinetic energy


Solar energy

2 In heating water:


Cutting trees


Burning wood


Solar energy

3 In mobile phones:


Light & sound energies


Coal


Sun


Cutting trees


Battery in mobile


Electric Power Stations



Unit (3) Concept (1) Lesson (3)

1 Choose the correct answer:

1. During ...., chemical energy changes to kinetic energy.

   a. running b. reading

   c. driving a bike d. a & c

2. On driving a bike, a part of the kinetic energy changes to .... energy due to the friction between the wheels and the road.

   a. heat b. sound

   c. light d. potential

3. .... convert electric energy to light energy.

   a. Fans b. Batteries

   c. Electric bulbs d. Bikes

4. You feel .... when you approach your hand to an electric bulb.

   a. cold b. hot

   c. happy d. angry

5. Which of the following statements is correct?

   a. Energy can't be changed from one form to another.

   b. Energy can be changed from one form to another.

   c. Energy may be lost or destroyed.

   d. Energy can be created.

6. "Energy is saved", this is known as the ....
   a. Law of Conservation of Energy
   b. Law of Attraction Force
   c. First Law of Newton   d. Second Law of Newton

2 Complete the following:

1. On running, ... energy changes to .... energy.
2. A part of the kinetic energy in a moving car changes to .... due to the friction between the .... and the ....
3. Electric lamps change .... energy to .... energy.
4. You feel .... when you approach your hand to an electric lamp.
5. Energy is neither .... nor ...., but it ....

3 Write the scientific term:

1. A device used to light houses. (................)
2. The energy stored in food. (................)
3. The energy produced due to friction. (................)
4. Energy is neither created nor destroyed. (................)

4 Put (✓) or (✗):

1. Energy can be changed from one form to another. (   )
2. You feel cold when you approach your hand to an electric bulb. (   )
3. Electric lamps convert electric energy to light energy. (   )

5 Study the opposite figure, then choose the correct answer:

1. The input energy is .... energy.
   (chemical – kinetic - electric)
2. The output energy is .... energy.
   (chemical - kinetic- electric)
3. As the speed of the car increases, its kinetic energy ....
   (increases – decreases – doesn't change)
4. The driver's body move .... when he/she stops.
   (forward – backward - upward)
5. The wheel of the car becomes .... after stopping
   (cold – hot - weak)

6 Mention the input and output energies of the following figures

Figure	Input Energy	Output Energy
1	....	....
2	....	....
3	....	....
4	....	....
5	....	....



Unit (3) Concept (1) Lesson (4)

1 Choose the correct answer:

1. The input energy in the hair dryer is .... energy.
   a. electric   b. heat
   c. sound   d. kinetic
2. The function of a hair dryer is ....
   a. air movement   b. motor sound
   c. drying hair   d. no correct answers
3. Heat energy is the .... energy in the hair dryer.
   a. input   b. output
   c. lost   d. no correct answers
4. Kinetic energy is the .... during running.
   a. input   b. output
   c. lost   d. no correct answers
5. The output energy in the hair dryer is .... energy.
   a. light   b. sound
   c. data processing   d. all the following

2 Complete the following:

1. The function of the hair dryer is ....
2. ...., ... and .... energies are resulted in a hair dryer.
3. ...., ... and .... energies are resulted in a mobile phone.
4. Electric energy is the .... energy in mobile phones and hair dryers.

3 Put (✓) or (✗):

1. Air movement is the function of the hair dryer. ( )
2. Kinetic energy is produced in the hair dryer. ( )
3. Data processing is the output energy in mobile phones. ( )
4. Energy is always saved and not destroyed. ( )

4 Study these figures and classify the energies to input & output

Electric energy – Heat energy –
Sound energy – Kinetic energy

Input Energy	Output Energy
....	....
....	....
....	....
....	....

Electric energy – Heat energy – Light energy

Input Energy	Output Energy
....	....
....	....
....	....
....	....



Unit (3) Concept (1) Lesson (5)

1 Choose the correct answer:

1. Ecologists study the flow of energy in difficult ecosystems, such as the ....
   a. North Pole
   b. bottom of oceans
   c. forests
   d. a & b
2. Any change in the flow of energy in difficult ecosystems ....
   a. causes pollution
   b. causes climate changes
   c. affects the living organisms
   d. no correct answer
3. .... design solutions for the mobile screen to obtain light energy.
   a. Ecologists
   b. Engineers
   c. Designers
   d. No correct answer
4. The mobile phone ....
   a. consume a small amount of energy in a short time
   b. consume a small amount of energy in a long time
   c. consume a large amount of energy in a short time
   d. consume a large amount of energy in a long time



2 Write the scientific term:

1. They study the flow of energy in difficult ecosystems. (..................)

2. They modify the mobile battery to last for a longer time after charging it. (..................)

3. Areas affected hardly by decreasing the flow of energy to it. (..................)

3 Complete the following:

1. .... study the flow of energy in difficult ecosystems, such as .... and ....

2. Any change in the flow of energy in difficult ecosystems affects ....

3. Mobile phones consume a .... amount of energy in a .... time.

4. .... modify the mobile battery to last for a longer time after charging it.



Model Exam 1

Unit (3) Concept (1)

1 Choose the correct answer:

1. Curiosity is the most famous .... on Mars.
   a. application b. spacecraft
   c. robot d. rocket
2. To make a battery work again, we must .... it.
   a. charge b. change
   c. burn d. a & b
3. .... is used in electric power stations to produce electricity.
   a. Gasoline b. Coal
   c. Water d. No correct answer
4. Which of the following statements is correct?
   a. Energy can't be changed from one form to another.
   b. Energy can be changed from one form to another.
   c. Energy may be lost or destroyed.
   d. Energy can be created.
5. .... design solutions for the mobile screen to obtain light energy.
   a. Ecologists b. Doctors
   c. Engineers d. No correct answer

2 Write the scientific term:

1. The energy stored in food. (..................................)
2. A device used to transfer images and sounds. (..................................)
3. The energy produced due to friction. (..................................)
4. They study the flow of energy in difficult ecosystems. (..................................)



3 Complete the following:

1. Energy makes devices .... and ....
2. .... is used in electric power stations to produce electricit
3. Vehicles on Mars change solar energy into .... and .... energies to operate thei .... to move on Mars.
4. You feel .... when you approach your hand to an electri lamp.

4 Put (✓) or (✗):

1. Air movement is the function of the hair dryer. ( )
2. Any energy chain starts with the Sun. ( )
3. The output energy in a mobile phone is light energy only. ( )
4. The mobile phone consume a small amount of energy in a long time. ( )

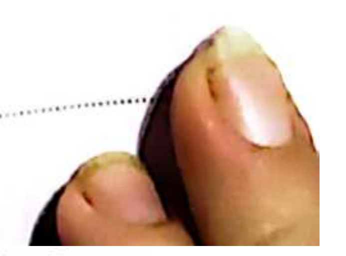
5 Complete the following table:

Figure	Input Energy	Output Energy
1	....	....
2	....	....
3	....	....

6 What is meant by:

– Law of Conservation of Energy.

....





Model Exam 2

Unit (3) Concept (1)

1 Choose the correct answer:

1. Ecologists study the flow of energy in difficult ecosystems, such as the ....
   a. North Pole b. bottom of oceans
   c. forests d. a & b

2. Heat energy is .... in solar heaters.
   a. consumed b. produced
   c. lost d. destroyed

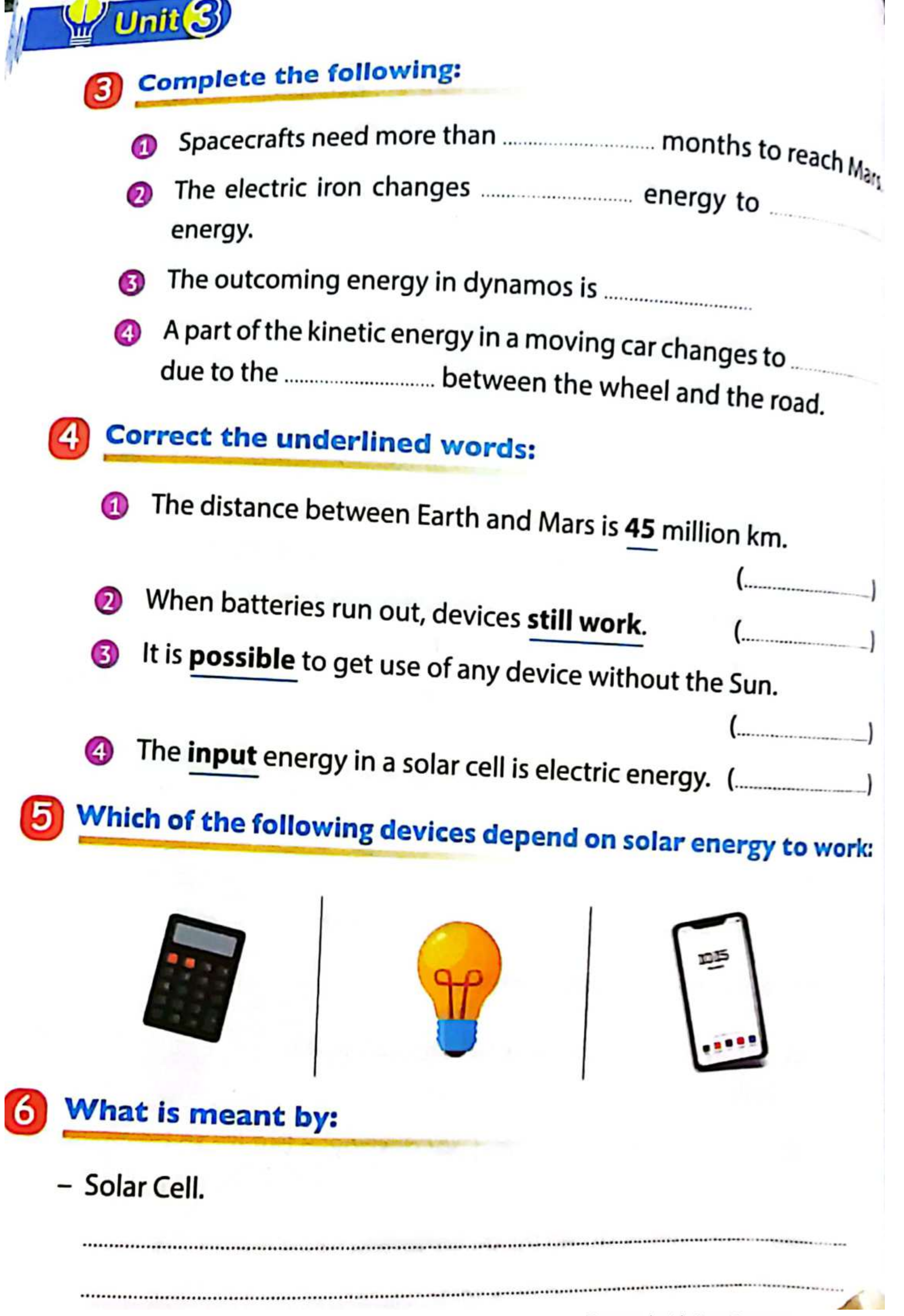
3. All these devices consume electric energy, except ....
   a. solar cells b. radios
   c. TV d. mobiles

4. A hair dryer changes electric energy into .... energy.
   a. kinetic b. sound
   c. heat d. all the following

5. .... energy is stored in trees.
   a. Solar b. Electric
   c. Chemical d. Potential

2 Write the scientific term:

1. They modify the mobile battery to last for longer time after charging it. (................................)
2. Energy is neither created nor destroyed but it can be changed. (................................)
3. The energy stored inside batteries. (................................)
4. Energy consumed by a solar heater. (................................)



3 Complete the following:

1. Spacecrafts need more than .... months to reach Mars.
2. The electric iron changes .... energy to .... energy.
3. The outcoming energy in dynamos is ....
4. A part of the kinetic energy in a moving car changes to .... due to the .... between the wheel and the road.

4 Correct the underlined words:

1. The distance between Earth and Mars is **45** million km. (....................)
2. When batteries run out, devices **still work**. (....................)
3. It is **possible** to get use of any device without the Sun. (....................)
4. The **input** energy in a solar cell is electric energy. (....................)

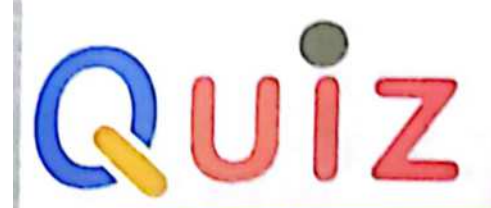
5 Which of the following devices depend on solar energy to work:

6 What is meant by:

– Solar Cell.

....

....



Unit (3) Concept (2) Lesson (1)

1 Choose the correct answer:

1. The main source of fuel is the ....
   a. wind b. waterfalls
   c. sun d. no correct answer
2. Fossil fuel is extracted from ....
   a. mountains b. forests
   c. rivers d. underground
3. Vehicles need .... to move.
   a. food b. fuel
   c. water d. no correct answer
4. .... is (are) from the importance of fuel.
   a. Operating cars b. Generating electricity
   c. Warming houses d. All the previous
5. When the fuel inside the car runs out, the car ....
   a. stops b. moves
   c. a & b d. no correct answer
6. The wheels of the car rotate when the fuel inside the car ....
   a. runs out b. ends
   c. burns d. no correct answer
7. .... is (are) from the examples of fossil fuel.
   a. Coal b. Natural gas
   c. Petroleum d. All of the previous

2 Correct the underlined words:

1. Any energy chain **ends** with the Sun. ( )
2. Fossil fuels are extracted from **mountains**. ( )
3. When fuel **burns** inside a car, the car stops. ( )
4. When fuel runs out, the car **moves**. ( )
5. Petroleum is an example of **biofuel**. ( )

3 Complete the following:

1. Any energy chain starts with the ....
2. ...., ... and .... are examples of fossil fuel.
3. The wheels of the car .... when fuel burns inside the car engine.
4. The car stops, when the fuel ....
5. ...., ... & .... are from the importance of fossil fuel.

4 Write the scientific term:

1. It burns inside the car engine to make the car move. ( )
2. The main source of fuel. ( )

5 What is the importance of:

1. Fossil fuel.

....

2. Fuel.

....



Unit (3) Concept (2) Lesson (2)

1 Choose the correct answer:

1. Burning fuel produces .... energy.
   - a. electric
   - b. kinetic
   - c. potential
   - d. heat
2. .... is the oldest fuel that is used all over the world.
   - a. Coal
   - b. Wood
   - c. Petroleum
   - d. Natural gas
3. .... is a non-renewable source of energy.
   - a. Fossil fuel
   - b. Biofuel
   - c. Sun
   - d. Wind
4. .... is the fuel made of living organisms that can be planted.
   - a. Fossil fuel
   - b. Biofuel
   - c. Petroleum
   - d. Gasoline
5. .... is an example of biofuel.
   - a. Petroleum
   - b. Coal
   - c. Corn
   - d. Natural gas
6. .... is (are) example (s) of fossil fuel.
   - a. Petroleum
   - b. Coal
   - c. Natural gas
   - d. All the following
7. From the disadvantages of the overuse of fossil fuel is (are) ....
   - a. cutting trees
   - b. removal of forests
   - c. air pollution
   - d. a & b
8. From the disadvantages of biofuel is (are) ....
   - a. cutting trees
   - b. removal of forests
   - c. air pollution
   - d. a & b



9. The rate of the consumption of fossil fuel is .... the rate of its formation.

a. more than
b. less than
c. equal to
d. no correct answer

10. .... is produced from the decomposition of plants or trees.

a. Petroleum
b. Natural gas
c. Coal
d. Benzene

11. .... is (are) produced from the decomposition of old aquatic organisms.

a. Petroleum
b. Natural gas
c. Coal
d. a & b

12. .... takes millions of years to be formed.

a. Fossil fuel
b. Biofuel
c. Charcoal
d. No correct answer

13. Ethanol is produced from ....

a. grass
b. corn
c. coal
d. a & b

14. Global warming is one of the disadvantages of burning ....

a. biofuel
b. petroleum
c. coal
d. b & c

15. All the following are non-renewable sources of energy, except ....

a. coal
b. wood
c. petroleum
d. benzene

16. All the following are renewable sources of energy, except ....

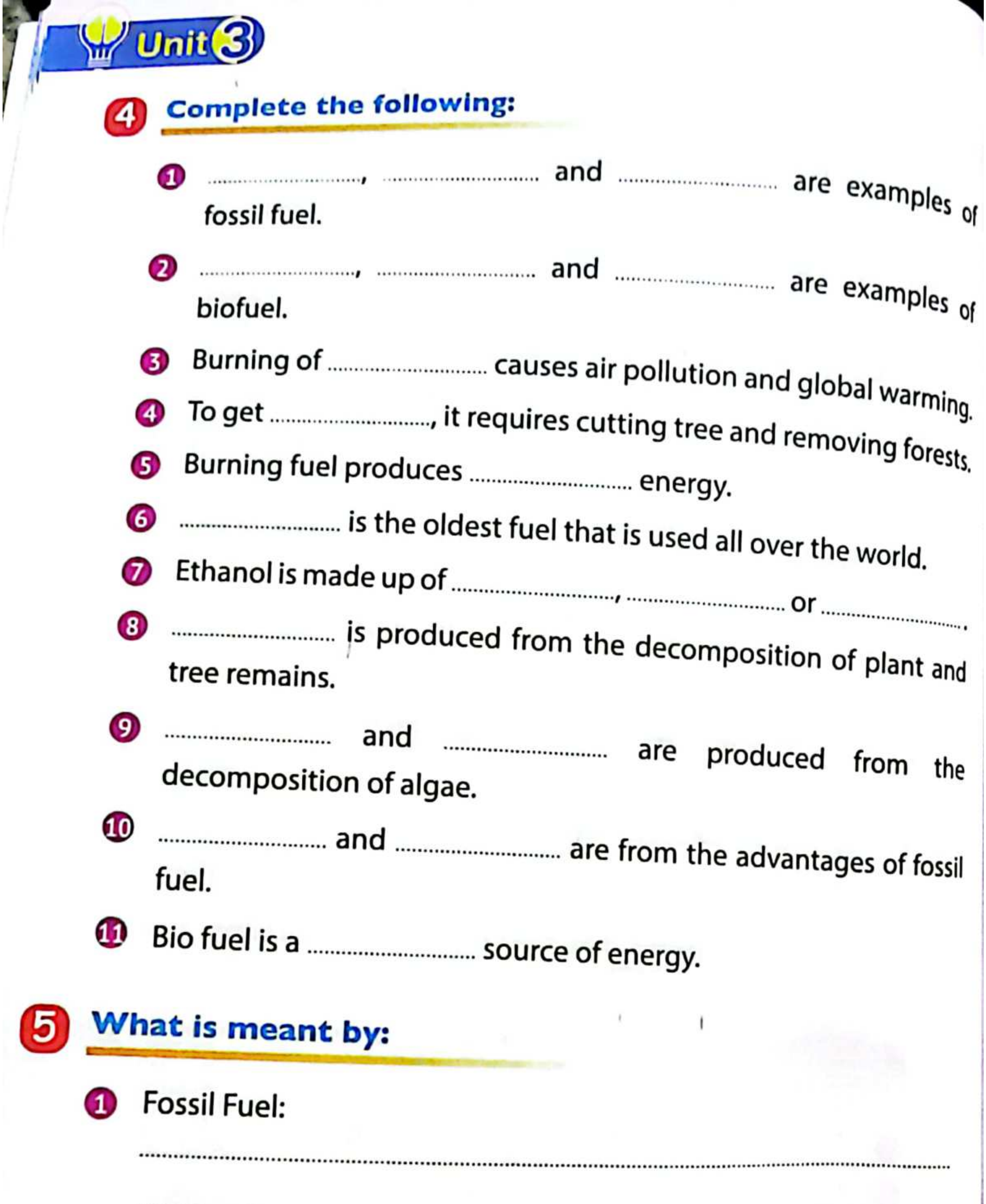
a. corn
b. wood
c. petroleum
d. grass

2 Correct the underlined words:

1. **Coal** is the oldest fuel that is used all over the world. (..............................)
2. Burning fuel produces **light** energy. (..............................)
3. **Petroleum** is a renewable source of energy. (..............................)
4. **Corn** is a non-renewable source of energy. (..............................)
5. **Charcoal** is made up of grass, corn or wood chips. (..............................)
6. To get **fossil fuel**, it requires cutting trees & removing forests. (..............................)
7. **Petroleum** is produced from the decomposition of tree remains. (..............................)
8. **Coal** is produced from the decomposition of algae. (..............................)
9. Burning of **biofuel** causes air pollution & global warming. (..............................)

3 Write the scientific term:

1. It is the fuel resulting from the decomposition of the remains of living organisms that lived on the earth millions of years ago. (..............................)
2. It is the fuel made from the living organisms that can be grown. (..............................)
3. It is made up of grass, corn or wood chips. (..............................)
4. A Biofuel that made up of wood. (..............................)
5. It is produced from the decomposition of plant and tree remains. (..............................)
6. It is produced from the decomposition of marine organisms. (..............................)



4 Complete the following:

1. ………………, ……………… and ……………… are examples of fossil fuel.
2. ………………, ……………… and ……………… are examples of biofuel.
3. Burning of ……………… causes air pollution and global warming.
4. To get ………………, it requires cutting tree and removing forests.
5. Burning fuel produces ……………… energy.
6. ……………… is the oldest fuel that is used all over the world.
7. Ethanol is made up of ………………, ……………… or ……………….
8. ……………… is produced from the decomposition of plant and tree remains.
9. ……………… and ……………… are produced from the decomposition of algae.
10. ……………… and ……………… are from the advantages of fossil fuel.
11. Bio fuel is a ……………… source of energy.

5 What is meant by:

1. Fossil Fuel:

………………………………………………………………………………………………

………………………………………………………………………………………………

2. Biofuel:

………………………………………………………………………………………………

………………………………………………………………………………………………

6 Label the following figures, then classify them into biofuel or fossil fuel:

Figure	Represents	Biofuel	Fossil fuel
1	Wood	✓	....
2	....	....	....
3	....	....	....
4	....	....	....
5	....	....	....

7 Give reason for:

1. Fossil fuel is a non-renewable source of energy.

....

....

2. Biofuel is a renewable source of energy.

....

....



Unit (3) Concept (2) Lesson (3)

1 Choose the correct answer:

1. The remains of old organisms are buried under ....
   a. rocks   b. sediments
   c. a & b   d. no correct answer
2. Under the effect of high ...., the remains of old organisms are transferred to fossil fuel.
   a. temperature & pressure
   b. temperature & force
   c. temperature & energy
   d. no correct answer
3. .... is (are) burnt and producing high heat energy.
   a. Petroleum   b. Natural gas
   c. Coal   d. All the previous
4. .... moves the turbines in electric power stations.
   a. Air   b. Steam
   c. Water   d. No correct answer
5. Electricity transfers through .... wires to cities.
   a. long & huge   b. long & thin
   c. short & huge   d. short & thin

2 Complete the following:

1. The remains of old organism are buried under .... and ....
2. Under the effect of high .... and ...., the remains of old organism change into ....

3. Electricity is generated by burning .... or .... in electric power stations.
4. The petroleum or natural gas is burnt and produces .... energy.
5. .... starts to move turbines in electric power stations.
6. A dynamo converts .... energy in the turbines into .... energy.

3 Write the scientific term:

1. It the energy produced from burning fossil fuels. (....................)
2. The device which changes kinetic energy into electric energy. (....................)

4 These steps represent the generation of electricity in electric power stations. Arrange the following steps from the start to the end:

- Steam starts to move turbines.
- The petroleum or natural gas burns and produces thermal energy.
- Electricity transfers through huge wires to cities.
- The dynamo converts kinetic energy in turbines into electric energy.
- Thermal (heat) energy is used to heat water and produce steam.

....

....

....

....

....



Unit (3) Concept (2) Lesson (4)

1 Choose the correct answer:

1. Petroleum oil is considered as a .... source of energy.
   - a. permanent
   - b. renewable
   - c. non-renewable
   - d. no correct answer
2. Water is considered as a .... source of energy.
   - a. permanent
   - b. renewable
   - c. non-renewable
   - d. no correct answer
3. The amount of .... is limited on Earth.
   - a. biofuel
   - b. fossil fuel
   - c. a & b
   - d. no correct answer
4. To reduce air pollution, we must ....
   - a. walk instead of driving cars
   - b. use public transportation
   - c. turn off lamps if we don't need them
   - d. all the previous
5. The rate of consumption of fossil fuel is .... the rate of its formation.
   - a. more than
   - b. less than
   - c. equal to
   - d. no correct answer
6. Petroleum is formed from the decomposition of ....
   - a. bacteria
   - b. diatom algae
   - c. fungus
   - d. euglena



2 Complete the following:

1. The amount of fossil fuel is .... on Earth.
2. The rate of formation of petroleum is .... than the rate of its consumption.
3. The chemical structure of water and petroleum are ....
4. Petroleum is formed from the decomposition of old marine organisms called ....
5. Diatom algae is very .... organism, smaller than the head of a ....
6. Water is considered as a .... source of energy.

3 Put (✓) or (✗):

1. Water is a non-renewable source of energy. (   )
2. The chemical structure of water and petroleum is different. (   )
3. The amount of petroleum on Earth is limited. (   )
4. We must light up electric bulbs and electric devices if we don't need them. (   )

4 Write the scientific term:

1. They are very tiny organisms, smaller than the head of a pin. (..................................)
2. The amount of it on Earth is limited. (..................................)



5 Give reason for:

1. Water is a renewable sources of energy.

....

....

2. Petroleum is a non-renewable sources of energy.

....

....

6 How to reduce the burning of fossil fuel:

1. ....
2. ....
3. ....

7 How to reduce the consumption of water:

....

....

....

....

Model Exam 1

Unit (3) Concept (2)

1 Choose the correct answer:

1. Fossil fuel is extracted from ....
   a. mountains b. forests
   c. rivers d. underground earth
2. .... is the oldest fuel that used is all over the world.
   a. Coal b. Wood
   c. Petroleum d. Natural gas
3. .... is an example of biofuel.
   a. Petroleum b. Coal
   c. Corn d. Natural gas
4. .... moves the turbines in electric power stations.
   a. Air b. Steam
   c. Water d. No correct answer
5. Petroleum is formed from the decomposition of ....
   a. bacteria b. diatom algae
   c. fungus d. euglena

2 Write the scientific term:

1. It the energy produced from burning fossil fuel. (............)
2. The amount of it on Earth is limited. (............)
3. It is made up of grass, corn or wood chips. (............)
4. The main source of fuel. (............)

3 Complete the following:

1. Any energy chain starts with the ....
2. ...., ... and .... are from the importance of fossil fuel.

3. To get .... , it requires cutting trees and removing forests.
4. The remains of old organisms are buried under rocks and ....

4 Correct the underlined words:

1. **Coal** is the oldest fuel that is used all over the world. (............)
2. To get **fossil fuel**, it requires cutting trees & removing forests. (............)
3. The **physical** structure of water and petroleum is different. (............)
4. We must **light up** electric bulbs and electric devices if we don't need them. (............)

5 What is meant by:

- Diatom Algae

....

....

6 Give reason for:

- Biofuel is a renewable source of energy.

....

....

7 What is the importance of:

- Dynamo

....

....



Model Exam 2

Unit (3) Concept (2)

1 Choose the correct answer:

1. The wheels of the car rotate when the fuel inside the car ....
   a. runs out b. ends
   c. burns d. no correct answer

2. .... Is produced from the decomposition of plants or trees.
   a. Petroleum b. Natural gas
   c. Coal d. Benzene

3. Ethanol is produced from ....
   a. grass b. corn
   c. coal d. a & b

4. The remains of old organisms are buried under ....
   a. rocks b. sediments
   c. a & b d. no correct answer

5. Water is considered as a .... source of energy.
   a. permanent b. renewable
   c. non-renewable d. no correct answer

2 Write the scientific term:

1. The device which changes kinetic energy into electric energy. (..................)
2. They are very tiny organisms, smaller than the head of a pin. (..................)
3. It is produced from the decomposition of plant and tree remains. (..................)
4. It burns inside the car engine to make the car move. (..................)

3 Complete the following:

1. .... , ... and .... are examples of fossil fuel.
2. The wheels of the car .... when fuel burns inside the car engine.
3. Burning of .... causes air pollution and global warming.
4. .... starts to move the turbines in electric power stations.

4 Correct the underlined words:

1. **Charcoal** is made up of grass, corn or wood chips. (............)
2. When fuel **burns** inside car, the car stops. (............)
3. Burning fuel produces **light** energy. (............)
4. Burning **biofuel** causes air pollution & global warming. (............)

5 What is meant by:

- Biofuel

....

....

6 Give reason for:

- Water is a renewable source of energy.

....

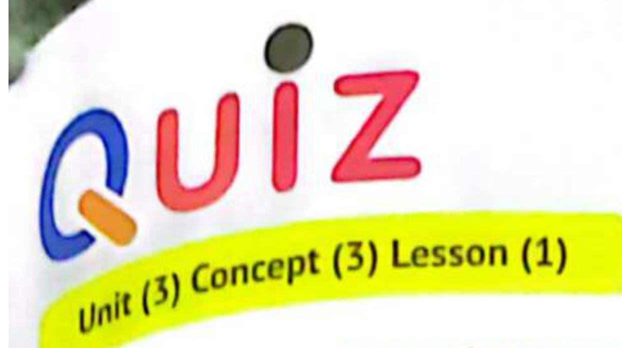
....

7 What is the importance of:

- Fossil fuel

....

....



Unit (3) Concept (3) Lesson (1)

1 Choose the correct answer:

1. .... is the energy that run out faster than us consuming it.
   a. Renewable source of energy
   b. Non-renewable source of energy
   c. Permanent source of energy
   d. Solar energy

2. All of these are examples of renewable sources of energy, except ....
   a. solar energy
   b. wind energy
   c. coal
   d. water falls

3. People use machines to ....
   a. make their life easier
   b. get tasks done faster
   c. save their effort
   d. all the following answers

4. The number of blades in a modern mill is .... the number of blades in an old windmill.
   a. more than
   b. less than
   c. equal to
   d. double

5. A modern windmill is .... than an old windmill.
   a. taller
   b. shorter
   c. heavier
   d. no correct answer

6. The input energy in the flashlight is ....
   a. electric energy
   b. chemical energy
   c. kinetic energy
   d. no correct answer

7. .... depends on a renewable source of energy.
   a. Petroleum oven b. Gas oven
   c. Solar cell d. Flashlight

8. The electric heater depends on a .... source of energy.
   a. renewable b. non-renewable
   c. permanent d. no correct answer.

9. Coal is the source of energy in a ....
   a. gas oven b. fireplace
   c. petroleum oven d. solar heater

10. .... were used to grind grains.
   a. Solar panels b. Windmills
   c. Fireplaces d. Gas ovens

11. In a windmill, it is better to ....
   a. increase the number of blades
   b. decrease the number of blades
   c. make its blades light
   d. b & c

12. The .... produces heat and depends on a non-renewable source of energy.
   a. electric heater b. solar heater
   c. gas oven d. no correct answer

2 Put (✓) or (✗):

1. Waterfalls are from the renewable sources of energy. (   )
2. Wind moves the windmill blades to generate kinetic energy. (   )
3. A modern windmill is shorter than an old windmill. (   )
4. Flashlight depends on a non-renewable source of energy. (   )

5. Coal is used to operate the gas oven. ( )
6. All devices depend on renewable sources of energy. ( )
7. The output energy in a solar heater is solar energy. ( )
8. Old windmills are used in grinding grains. ( )
9. Natural gas is considered from renewable sources of energy. ( )
10. The outcoming energy of a battery is chemical energy. ( )

3 Fill in the gaps using the following words:

(Coal – heat – chemical – consumes – produces – Wind – taller - shorter)

1. .... is from renewable sources of energy.
2. The input energy in a battery is .... energy.
3. The modern windmill is .... than the old windmills.
4. .... is used in the fireplace to produce heat energy.
5. A solar heater .... heat energy.

4 Write the scientific term:

1. It is the energy that will not run out faster than us consuming it. (....................)
2. They are used to make the life of people easier and get tasks done faster. (....................)
3. A device at which wind rotates its blades and it produces kinetic energy. (....................)
4. The source of energy of a flashlight. (....................)
5. The source of energy of a fireplace. (....................)
6. The outcoming energy of a solar heater. (....................)
7. The incoming energy in an electric heater. (....................)



5 Complete the following:

1. Machines need .... to be operated.
2. .... is the energy that will not run out faster than consuming it.
3. .... and .... are renewable sources of energy.
4. .... and .... are non-renewable sources of energy.
5. People use machines to .... and ....
6. Windmills were used to ....
7. An old windmill is .... than a modern windmill.
8. The number of blades in a modern wind mill is .... than the old one.
9. Any device needs .... to move
10. The input energy in a flashlight is .... energy.
11. The output energy in a flashlight is .... energy.
12. Petroleum oven depends on a .... source of energy.
13. The .... changes electric energy into heat energy.
14. Coal is used in the .... to produce heat.
15. Coal is used in the .... to generate electricity.
16. The input energy in a fireplace is ....
17. The.................... & .... produce heat and depend on non-renewable sources of energy.
18. The.................... & .... produce heat and depend on renewable sources of energy.

6 Study the figures, then answer the following questions:

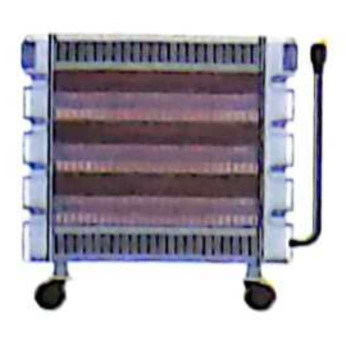


Figure (1)



Figure (2)

1. What is the output energies of the two figures?

   ....

   ....

2. Which one of them depend on a non-renewable source of energy?

   ....

   ....

7 Complete the following table:

Device	Source of Energy	Source of Energy Kind
Flashlight	....	....
Solar heater	....	....
Gas oven	....	....
Fireplace	....	....
Electric heater	....	....



8 What is the importance of:

1. Machines: ....
2. Windmills: ....
3. Solar panels: ....
4. Flashlight: ....
5. Fireplace: ....

9 What is meant by:

1. Renewable Source of Energy.

....

....

2. Non-renewable Source of Energy.

....

....

3. Solar Panels.

....

....

10 Give an example for:

1. Renewable source of energy:

....

2. Non-renewable source of energy:

....



3. A device that depends on a renewable source of energy:

....

4. A device that depends on a non-renewable source of energy:

....

11 What will happen when:

1. Wind moves the blades of a windmill.

....

....

2. Water moves the blades of a watermill.

....

....

12 Give reason for:

1. Solar energy is a renewable source of energy.

....

....

2. Petroleum is a non-renewable source of energy.

....

....

3. People use machines.

....

....



Unit (3) Concept (3) Lesson (2)

1 Choose the correct answer:

1. The surface of the .... is not solid.
   a. Sun
   b. Moon
   c. Earth
   d. Mars
2. The surface of the Sun ....
   a. is solid as the Moon
   b. is gas as the Moon
   c. isn't solid as the Moon
   d. isn't gas as the Moon
3. The Sun consists of different gases, such as ....
   a. hydrogen & nitrogen
   b. hydrogen & helium
   c. helium & oxygen
   d. oxygen & nitrogen
4. The surface of the Sun is called ....
   a. sun sphere
   b. gaseous sphere
   c. photosphere
   d. ionosphere
5. Sun is very important because ....
   a. it provides us with heat energy
   b. it provides us with light energy
   c. plants need it to grow up
   d. all the previous
6. If you look directly to the sun for a long time, your eyes w

   ....
   a. see rainbow
   b. be damaged
   c. be burned
   d. no correct answer

7. Without the sun ....
   a. plants will grow up but all animals will die
   b. plants will die but all animals will still be alive
   c. people can depend on the Moon instead of it
   d. life disappears on Earth

8. Heat and light energies transfer from space to us in the form of ....
   a. curved lines
   b. waves
   c. zigzag lines
   d. circles

9. Sunrays are called ....
   a. infrared rays
   b. X-rays
   c. visible rays
   d. radioactivity

10. .... help farmers to grow their plants that need hot weather in winter.
   a. Irrigation machines
   b. Greenhouses
   c. Tissue culture
   d. No correct answer

11. The heat energy of the Sun used to warm the .... part of a greenhouse.
   a. internal
   b. external
   c. a & b
   d. no correct answer

12. Curved mirrors are used for ....
   a. warming houses
   b. cooking
   c. getting electricity
   d. no correct answer

13. To warm our houses, we must place a ....
   a. large window on the wall facing the sun
   b. large window on the wall not facing the sun
   c. small window on the wall facing the sun
   d. small window on the wall not facing the sun

14. A solar heater is placed at the ....
 a. streets b. markets
 c. bathrooms d. tops of buildings

15. .... is (are) the output energy in solar panels.
 a. Solar energy b. Electric energy
 c. Heat energy d. b & c

16. A .... is from the devices that operate by using solar energy.
 a. fan b. calculator
 c. TV d. radio

2 Put (✓) or (✗):

1. The surface of the Sun is called photosphere. ( )
2. The surface of the Sun is solid as the Moon. ( )
3. Life disappears on Earth in the absence of the Sun. ( )
4. Sunrays are called radioactivity. ( )
5. Greenhouse help farmers to grow plants that need cold weather in summer. ( )
6. A solar heater is always placed at the top of buildings. ( )
7. A solar cell consists of a large number of small solar panels. ( )
8. The output energy in calculators is the solar energy. ( )

3 Write the scientific term:

1. It is a gas region at the edge of the sun that emits light and heat. (............)
2. It helps farmers in planting crops that need hot weather in winter. (............)

3. They are used to direct the sunrays towards the cooking pans. (..................)

4. They are placed at the top of buildings. (..................)

5. It consists of a large number of small solar cells. (..................)

6. The input energy of the calculator. (..................)

4 Complete the following:

1. Sun consists of different gases, such as .... and ....

2. The surface of the Sun is called ....

3. Sun provides us with .... and .... energies.

4. If you look directly to the sun for a long time, your eyes will be ....

5. Without the sun, the plants will ....

6. Sunrays are called ....

7. .... help farmers in planting crops that need hot weather in winter.

8. .... are used to direct sunrays towards the cooking pans.

9. The solar heater is placed at the ....

10. A solar panel consists of a large number of ....

11. Solar panels change .... energy into .... or .... energies.

12. The input energy in calculators is .... energy.

5 What is meant by:

1. Photosphere

....

....

2. Solar Energy

....

....

3. Solar Panels

....

....

4. Greenhouse

....

....

6 Study the figures, then answer the following questions:

Figure (1)	Figure (2)

1. **The following figure represents two plants:**

   a. Which figure represents the plant in the absence of the sun?

   ....

   b. What happens to the animals in the absence of the sun?

   ....

   c. What is the importance of the sun?

   ....

2. **The following figure represents a solar oven:**

   a. What type of mirrors are used in this device?

   ....

   ....

   b. What is the importance of this device?

   ....

3. **The following figure represents a solar heater:**

   a. The input energy is ....

   b. The output energy is ....

   c. It is placed at the ....

4. **The following figure represents a calculator:**

   a. The input energy is ....

   b. It contains .... provided and small ....

7 What is the importance of:

1. The sun.

   ....

2. Solar energy.

   ....

3. Solar panels.

4. Curved mirrors.

5. Greenhouse.

8 What will happen when:

1. You look directly to the sun for a long time.

2. The sun disappears suddenly.

3. Hydrogen reacts with helium in the Sun.

9 Give reason for:

1. Sun is very important to us.

2. You feel the warmth of the sun at night.

3. Greenhouses are very important to farmers.





Unit (3) Concept (3) Lesson (3)

1 Choose the correct answer:

1. Solar energy causes ....
   a. air movements
   b. wind blowing
   c. a & b
   d. no correct answer

2. .... change the kinetic energy of turbines into electric energy.
   a. Motors
   b. Dynamos
   c. Windmills
   d. Watermills

3. The correct arrangement for generating electricity by using wind energy is ....
   a. Sun – wind – electric lines – windmills - houses
   b. Sun – wind – windmills – electric lines - houses
   c. Sun – windmills – electric lines – wind - houses
   d. Sun – windmills – wind – electric lines - houses

4. Which of the following statements is correct?
   a. A dynamo changes electric energy into kinetic energy.
   b. The wind rotates the blades of watermills.
   c. Solar energy causes wind blowing.
   d. Electricity is transferred to cities through thin wires.

5. For generating a huge amount of electricity, it's better to ....
   a. increase the number of blades of the turbine
   b. decrease the number of blades of the turbine
   c. design light blades
   d. b & c

6. The most effective turbine in generating electricity is ....

a. 
b. 
c. 
d. 

2 Complete the following:

1. The sun .... the earth and the wind.
2. Solar energy causes air .... and wind ....
3. A dynamo changes .... energy to .... energy.
4. Electricity is transferred to cities through ....
5. It is better to .... the number of blades inside the turbine.

3 Write the scientific term:

1. It warms the earth and the wind. (................)
2. It causes air movement and wind blowing. (................)
3. It changes the kinetic energy into electric energy. (................)

4 Put (✓) or (✗):

1. The wind rotates the blades of windmills. ( )
2. The motor changes electric energy into heat energy. ( )
3. Electricity is transferred to cities through thin wires. ( )
4. It is better to decrease the number of blades of a turbine. ( )
5. Heavy blades are better than light blades in generating electricity. ( )

5 What is meant by:

- Dynamo

....

....

6 Study the figures, then answer the following questions:

1. **To generate electricity, arrange the following figures from the start to the end:**



....



....



....



....



....

6 **Choose from the opposite figures the most effective turbine & the reason:**

	Figure (1)	Figure (2)	Reason
a.			....
b.			....
c.			....

7 Complete the following table:

Device	Input Energy	Output energy
Motor	....	....
Dynamo	....	....

8 What will happen when:

1. The wind rotates the blades of the turbine.

....

....

2. We decrease the number of blades in the turbine.

....

....

3. We replace the light blades of turbines by heavy blades.

....

....

9 Give reason for:

1. Sun helps us in generating electricity by wind.

....

....

2. Modern windmills are better than old windmills.

....

....



Unit (3) Concept (3) Lesson (4)

1 Choose the correct answer:

1. Water of rivers stores great .... at the top of slopes.
   a. kinetic energy
   b. potential energy
   c. electric energy
   d. light energy

2. When the water of rivers falls from a high slope, ...
   a. potential energy is converted into kinetic energy
   b. kinetic energy is converted into potential energy
   c. potential energy is converted into electric energy
   d. kinetic energy is converted into electric energy

3. When the dams stop the flow of water, so the potential energy of water ....
   a. remains constant
   b. decreases
   c. increases
   d. changes to kinetic energy

4. Potential energy is converted gradually into kinetic energy when the ....
   a. dam stops the water
   b. dam allows water to pass
   c. water falls from a high slope
   d. b & c

2 Complete the following:

1. When the water of rivers falls from high slopes, potential energy is ....
2. The input energy of a dynamo is ....
3. When dams stop the flow of water, the potential energy ....
4. Electricity transfers to cities through .... and .... wires to light houses.

3 Put (✓) or (✗):

1. When dams stop water, the kinetic energy of water reaches its maximum value. (   )
2. When water becomes free, potential energy is changed to kinetic energy. (   )
3. A dynamo changes potential energy to kinetic energy. (   )

4 What will happen when:

1. Dams store the water of rivers.

....

....

2. The water of dams become free.

....

....





Model Exam 1

Unit (3) Concept (3)

1 Choose the correct answer:

1. A modern windmill is .... than an old windmill.
   - a. taller
   - b. shorter
   - c. heavier
   - d. no correct answer
2. Coal is the source of energy in the ....
   - a. gas oven
   - b. fireplace
   - c. petroleum oven
   - d. solar heater
3. The surface of the Sun ....
   - a. is solid as the Moon
   - b. is gas as the Moon
   - c. isn't solid as the Moon
   - d. isn't gas as the Moon
4. Which of the following statements is correct?
   - a. A dynamo changes electric energy into kinetic energy.
   - b. The wind rotates the blades of watermills.
   - c. Solar energy causes wind blowing.
   - d. Electricity is transferred to cities through thin wires.
5. Water of rivers stores great .... at the top of the slopes
   - a. kinetic energy
   - b. potential energy
   - c. electric energy
   - d. light energy

2 Write the scientific term:

1. It is the energy that will not run out faster than consuming (....................
2. The source of energy of a flashlight. (....................
3. It helps farmers in planting crops that need hot weather in wint (....................
4. The input energy of the calculator. (....................

3 Complete the following:

1. Machines need .... to be operated.
2. .... & .... produce heat and depend on non-renewable sources of energy.
3. Sun provides us with .... and .... energies.
4. Solar energy causes air .... and wind ....

4 Correct the underlined words:

1. Modern windmills are **shorter** than the old windmills. (....................)
2. **Coal** is used to operate the gas oven. (....................)
3. **Petroleum** is from the renewable sources of energy. (....................)
4. The **outcoming** energy of a battery is chemical energy. (....................)

5 What will happen when:

- The sun disappears suddenly.

....

....

6 What is meant by:

- Photosphere

....

....



Model Exam 2

Unit (3) Concept (3)

1 Choose the correct answer:

1. All of these are examples of renewable sources of energy, except ....
   a. solar energy
   b. wind energy
   c. coal
   d. water falls

2. In a windmill, it is better to ....
   a. increase the number of blades
   b. decrease the number of blades
   c. make its blades light
   d. b & c

3. The surface of the Sun is called ....
   a. sun sphere
   b. gaseous sphere
   c. photosphere
   d. ionosphere

4. Potential energy is converted gradually into kinetic energy when the ....
   a. dam stops the water
   b. dam allows water to pass
   c. water falls from a high slope
   d. b & c

5. The most effective turbine in generating electricity is ....
   a. 
   b. 
   c. 
   d. 

2 Write the scientific term:

1. It is used to make the life of people easier and get tasks done faster. (..............................)
2. The source of energy of a fireplace. (..............................)
3. It is a gas region at the edge of the Sun that emits light and heat. (..............................)
4. It consists of a large number of small solar cells. (..............................)

3 Complete the following:

1. A solar heater is placed at the ....
2. Sun consists of different gases, such as .... and ....
3. A modern windmill is .... than an old windmill.
4. Coal is used in a .... to produce heat.

4 Correct the underlined words:

1. **All** devices depend on renewable sources of energy. (..............................)
2. **Natural gas** is considered from renewable sources of energy. (..............................)
3. **Motor** changes kinetic energy into electric energy. (..............................)
4. When dams stop water, the **kinetic** energy of the water reaches its maximum value. (..............................)

5 Give reason for:

- We feel the warmth of the sun at night.

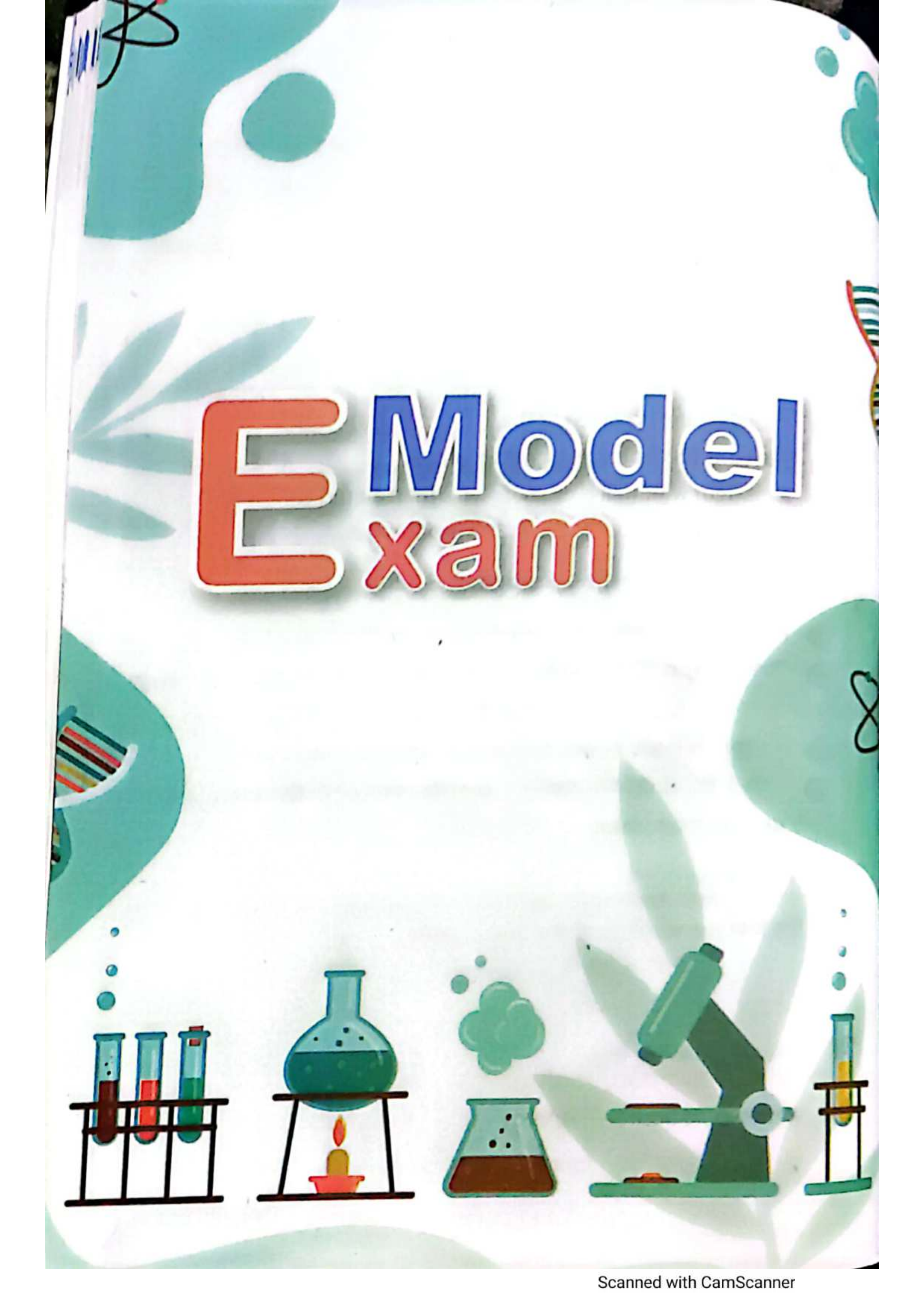
....

....

6 What is meant by:

- Renewable Source of Energy.

....


Model
Exam

Model Exam 1

1 Choose the correct answer:

1. Ecologists study the flow of Energy in difficult Ecosystems such as ....
   a. north pole b. bottom of oceans
   c. forests d. a & b
2. .... is (are) example (s) of biofuel.
   a. Petroleum b. Coal
   c. Corn d. Natural gas
3. Curiosity is the most famous .... on mars.
   a. Application b. Spacecraft
   c. Robot d. Rocket
4. Car seat-belt used to keep the body of driver from moving ....
   a. upward b. downward
   c. backward d. forward

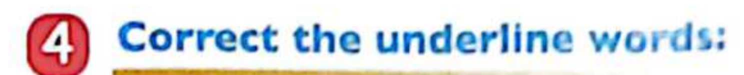
2 Write the scientific term:

1. It is a gas region at the edge of the sun that emits light and heat. (.....................)
2. The input energy in calculator. (.....................)
3. Energy is neither created nor destroyed but it can be changed. (.....................)
4. A heavy steel ball swinging on a cable. (.....................)

3 Complete the following:

1. Spacecraft needs more than .... months to reach mars.
2. Electric iron changes .... energy to .... energy.
3. Solar cars are .... in weight.

4. Batteries store .... energy and used to opera
....



4 Correct the underline words:

1. **Charcoal** is made up of grass, corn or wood chips. (..........)
2. **Electric** vehicles cause climate changes. (..........)
3. Any energy chain **ends** with the sun. (..........)
4. The **input** energy in the solar cell is electric energy. (..........)

5 Mention the input and output energies of the following







....

6 What meant by:

- Renewable source of energy

....

7 Give reason for:

- People use machines.

....

8 What is the importance of:

- Green house:

....



Model Exam 2

1 Choose the correct answer:

1. The amount of .... is limited on the earth.
   a. biofuel
   b. fossil fuel
   c. a & b
   d. no correct answers
2. Modern wind mill is .... than old wind mill.
   a. taller
   b. shorter
   c. heavier
   d. no correct answer
3. Sound energy is produced from all the following devices except ....
   a. Cellular phone
   b. TV
   c. Radio
   d. electric iron
4. The correct arrangement for generating electricity by the wind energy is ....
   a. Sun – wind – electric lines – wind mills - houses
   b. Sun – wind – wind mills – electric lines - houses
   c. Sun – wind mills – electric lines – wind - houses
   d. Sun – wind mills – wind – electric lines - houses

2 Write the scientific term:

1. A heavy steel ball swinging on a cable. (............................)
2. A device used to light houses. (............................)
3. The input energy in hand bell. (............................)
4. It burns inside car engine to make the car moves. (............................)

3 Complete the following:

1. Truck causes damage .... than the car.
2. Hair dryer changes .... energy to .... and .... energies.
3. Solar cars don't cause ....
4. .... and .... are non-renewable sources of energy.

4 Correct the underline words:

1. **Solar** vehicles need gas stations. (....................)
2. Coal is used to operate the **gas oven**. (....................)
3. Any energy chain **ends** with the sun. (....................)
4. Kinetic energy is **lost** during collision. (....................)

5 The following figure represents a solar heater:

1. The input energy is ....
2. The output energy is ....
3. It is placed on the ....

6 What's happen when:

- You look directly to the sun for a long time.

....

....

7 What is the importance of:

1. Seatbelt

....

2. Dams

....

Model Exam 3

1 Choose the correct answer:

1. The most effective turbine in generating electricity is ....

   a. b.

   c. d.

2. All the following are renewable sources of energy except ....

   a. corn b. wood

   c. petroleum d. grass

3. Heat energy is .... in solar heater.

   a. consumed b. produced

   c. lost d. destroyed

4. When a .... hits a person, he may be injured only and survive.

   a. train b. truck

   c. car d. bike

2 Write the scientific term:

1. To get it, it requires removal of forest and cutting tree.

   (..................)

2. Very tiny organisms, smaller than the head of a pin.

   (..................)

3. Device used to transfer images and sounds. (
4. The input energy of the calculator. (

3 Complete the following:

1. Air bag is made of thin .... material folded into the steering wheel.
2. .... and .... are examples of fossil fuel.
3. When a player hits the ball with a bat, the speed of the ball .... in the .... direction.
4. Batteries store .... energy and used to operate ....

4 Correct the underline words:

1. The surface of the **sun** is solid. (
2. When fuel **burns** inside a car, the car stops. (
3. **Solar** vehicle needs to be charged. (
4. Electricity transfer to cities through **thin** wires. (

5 Complete the following table:

Device	Input Energy	Output energy
Motor		
Dynamo		

6 What meant by:

- Photosphere

....

....

7 Give reason for:

- Petroleum is a non-renewable source of energy.

....

....

8 What is the importance of:

1. Air bag:

....

....

2. Fossil fuel:

....

....

Model Exam 4

1 Choose the correct answer:

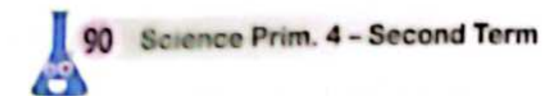
1. The surface of the sun is called
   a. sun sphere b. gaseous sphere
   c. photosphere d. ionosphere
2. .... contains chemical energy.
   a. Solar heater b. Batteries
   c. Radio d. TV
3. Ethanol is produced from ....
   a. grass b. corn
   c. coal d. a & b
4. Heat and light energies transfer from space to us in a form of ....
   a. curved lines b. waves
   c. zigzag lines d. circles

2 Write the scientific term:

1. It consists of large number of small solar cells. (............)
2. The input energy of the calculator. (............)
3. A heavy steel ball swinging on a cable. (............)
4. It is the energy produced from burning fossil fuel. (............)

3 Complete the following:

1. Sun consists of different gases such as .... an ....
2. .... produced from the decomposition of algae.
3. Solar vehicles don't need .... or ....
4. Solar energy causes air .... and wind ....



4 Correct the underlined words:

1. **All** devices depend on renewable sources of energy. (..................)

2. The chemical structure of water and petroleum is the **same**. (..................)

3. **Charcoal** is produced from the decomposition of tree remains. (..................)

4. After collision, the air bag **inflates** fast. (..................)

5 Which figure represents more severe damage and why?

Figure (1)

Figure (2)

6 What will happen when:

- When the ball of newton cradle is raised up

....

....

7 What is the importance of:

1. Curved mirrors in solar oven.

....

....

2. T.V

....

....

Model Exam 5

1 Choose the correct answer:

1. Coal is the source of energy in ....
   a. gas oven b. fire place
   c. petroleum oven d. solar heater
2. Water of rivers stores great .... at the top of slopes.
   a. Kinetic energy b. Potential energy
   c. Electric energy d. Light energy
3. Slow objects cause ....
   a. great damage that can't be repaired
   b. great damage that can be repaired
   c. small damage that can be repaired
   d. small damage that can't be repaired
4. The distance between earth and mars is .... Million kilometers.
   a. 54 b. 55
   c. 44 d. 45

2 Write the scientific term:

1. It is the moment of crashing of two objects together. (............
2. It is the energy that will not run out faster than consuming it. (............
3. Energy neither created nor destroyed. (............
4. It is made up of grass, corn or wood chips. (............

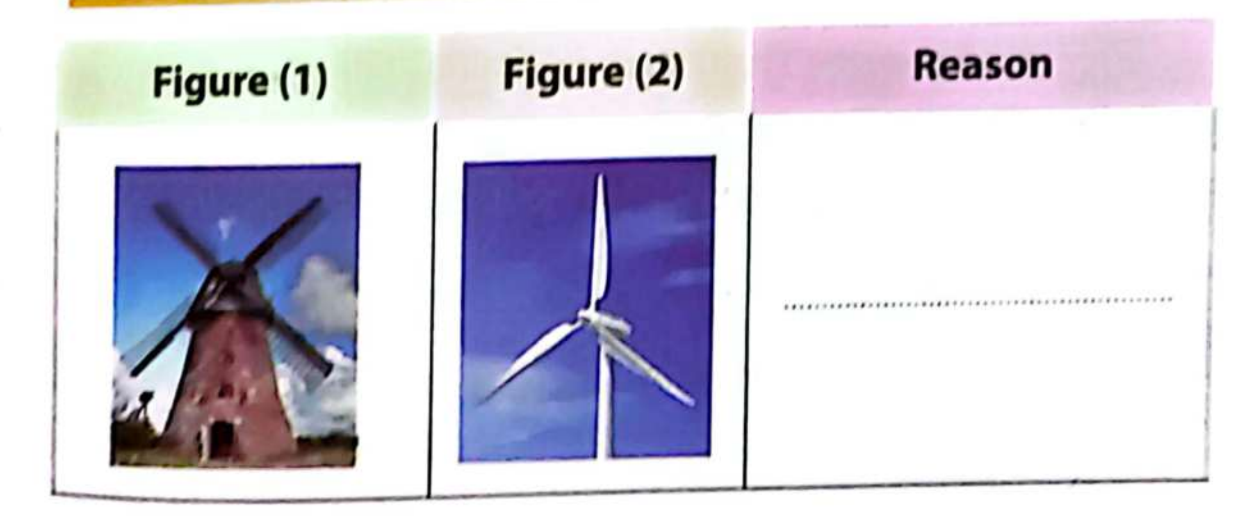
3 Complete the following:

1. Cars stop, when the fuel ....
2. ...., ... and .... are examples of biofuel.
3. During collision, The air bag ....
4. The input energy in running is .... energy

4 Correct the underline words:

1. heavy objects always cause damage **less** than light objects. (....................)
2. Burning of **biofuel** cause air pollution & global warming. (....................)
3. **Increasing** the number of blades is better. (....................)
4. **dynamo** changes electric energy into kinetic energy. (....................)

5 Choose from the below figures the most effective turbine & the reason:

Figure (1)	Figure (2)	Reason
		....

6 What meant by:

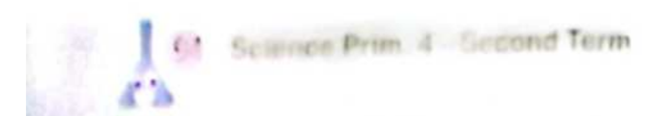
- Law of conservation of energy

7 What will happen when:

- The sun disappears suddenly

8 Give reason for:

- Any energy chain starts with the sun.



Model Exam 6

1 Choose the correct answer:

1. All of these are examples of renewable source of energy except ....
   a. solar energy b. wind energy
   c. coal d. water falls
2. .... is (are) example (s) of biofuel.
   a. Petroleum b. corn
   c. coal d. Natural gas
3. .... produces heat and depends on non-renewable source of energy.
   a. Electric heater b. Solar heater
   c. Gas oven d. No correct answer
4. Robots and vehicles on mars operated by................ .
   a. electric charger b. long-term batteries
   c. solar panels d. b & c

2 Write the scientific term:

1. It helps farmers planting crops that need hot weather in winter. (................)
2. They study flow of Energy in difficult ecosystems. (................)
3. It burns inside a car engine to make the car moves. (................)
4. It changes the kinetic energy into electric energy. (................)

3 Complete the following:

1. When water of rivers falls from high slopes, potential energy ....
2. Solar cells change .... energy to .... energy.

3. .... cars are light in weight.
4. .... , ... and .... are examples of fossil fuel.

4 Correct the underlined words:

1. **Electric** vehicles cause climate change. (....................)
2. The **outcoming** energy of battery is chemical energy. (....................)
3. Fossil fuels are extracted from **mountains**. (....................)
4. Petroleum is an example for **biofuel**. (....................)

5 Study the following figure then complete the following:

1. The boy uses a .... to hit the ball.
2. The energy transfer from the .... to the ....
3. The speed of the ball in .... in .... directions.

6 Give reason for:

- We feel warmth of the sun at night.

....

....

7 What is the importance of:

1. Motor

....

2. Solar energy

....

Model Exam 7

1 Choose the correct answer:

1. .... Produced from the decomposition of plants or trees.
   a. Petroleum b. Natural gas
   c. Coal d. Benzene
2. As object's speed increases, its kinetic energy ....
   a. increases b. decreases
   c. remains constant d. no correct answer
3. Solar heaters are placed on ....
   a. streets. b. markets.
   c. bathroom. d. top of building.
4. To make batteries work again, we must ....
   a. charge them b. change them
   c. burn them d. a & b

2 Write the scientific term:

1. It is a gas region at the edge of the sun that emits light and heat. (..................)
2. The main source of fuel. (..................)
3. It absorbs the energy of the car during collision. (..................)
4. Energy that consumed from solar heater. (..................)

3 Complete the following:

1. .... is used in fire place to produce heat energy.
2. .... is the energy produced due to friction.

3. Solar cars are .... in weight.
4. Fast rubber ball makes .... sound when it hit by racket than slower ball.

4 Correct the underlined words:

1. The wind rotates the blades of **watermills.** (....................)
2. **Coal** is the oldest fuel that used all over the world. (....................)
3. A crash investigator sees a car crash as a **joke.** (....................)
4. When fuel runs out, the car **moves.** (....................)

5 What is the type of fuel:

Figure (1)	Figure (2)	Figure (2)

6 What meant by:

- Renewable source of energy

....

....

7 How to reduce burning fossil fuel:

1. ....
2. ....
3. ....

Model Exam 8

1 Choose the correct answer:

1. .... depends on renewable source of energy.
   a. Petroleum oven b. Gas oven
   c. Solar cell d. Flash light
2. From the disadvantages of over use of fossil fuel is (are) ....
   a. cutting trees b. removal of forests
   c. air pollution d. a & b
3. .... used to move things.
   a. Dynamo b. Motor
   c. Hair dryer d. electric heater
4. The car with speed .... has the highest kinetic energy
   a. 100 km/h b. 80 km/h
   c. 60 km/h d. 40 km/h

2 Write the scientific term:

1. The vehicle that doesn't need any fuel or electricity. (............................)
2. It is the energy produced from burning fossil fuel. (............................)
3. The amount of it on the earth is limited. (............................)
4. The incoming energy in electric heater. (............................)

3 Complete the following:

1. When two cars collide in the .... direction, the damage will be less severe.
2. .... is the energy stored in food.

3. Coal is used in .... to produce electricity.
4. Heavy objects have .... energy.

4 Correct the underline words:

1. The **output** energy in a calculator is the solar energy. (..........................)
2. When a **car** hits a boy, he will survive. (..........................)
3. **wood** is a a non-renewable source of energy. (..........................)
4. Burning fuel produces **light** energy. (..........................)

5 Arrange the following energy chains from start to end:

- During running:

Chemical energy

Kinetic energy

Solar energy

6 What meant by:

- Solar panels

....

....

7 Give reason for:

- When you touch an electric lamp, you feel hot.

....

....

Model Exam 9

1 Choose the correct answer:

1. Modern windmills are .... than old windmills.
   a. taller b. shorter
   c. heavier d. no correct answer
2. Heat energy is .... in electric iron.
   a. consumed b. resulted
   c. lost d. destroyed
3. .... is the fuel made of living organisms that can be planted.
   a. Fossil fuel b. Biofuel
   c. Petroleum d. Gasoline
4. .... collision, the air bag deflates fast.
   a. Before b. During
   c. After d. no correct answer

2 Write the scientific term:

1. Vehicles that have batteries must be charged. (....................)
2. A famous game in which the player hits the ball with a bat. (....................)
3. The amount of it on the earth is limited. (....................)
4. It helps farmers planting crops that need hot weather in winter. (....................)

3 Complete the following:

1. It is better to .... the number of blades inside turbine.

2. A spacecraft needs more than .... Month to reach mars.
3. You feel .... when you approach your hand to the electric lamp.
4. The rate of formation of petroleum is .... than the rate of its consumption.

4 Correct the underline words:

1. **Motor** changes kinetic energy into electric energy. (........................)
2. Any energy chain **ends** with the sun. (........................)
3. To get **fossil fuel**, it requires cutting trees & removal of forests. (........................)
4. We must **light up** electric bulb and electric devices if we don't need it. (........................)

5 Mention the advantages and disadvantages of solar vehicles:

Advantages	Disadvantages
....	....
....	....
....	....
....	....

6 What is the importance of:

– Wrecking ball

....

....

Model Exam 10

1 Choose the correct answer:

1. Fast objects cause ....
   a. great damage that can be repaired
   b. great damage that can't be repaired
   c. small damage that can be repaired
   d. small damage that can't be repaired

2. The surface of the sun ....
   a. is solid such as moon
   b. is gas such as moon
   c. isn't solid such as moon
   d. isn't gas such as moon

3. Which of the following statements is correct?
   a. Energy can't be changed from one form to another.
   b. Energy can be changed from one form to another.
   c. Energy may be lost or destroyed.
   d. Energy can be created.

4. .... is the oldest fuel used all over the world.
   a. Coal
   b. Wood
   c. Petroleum
   d. Natural gas

2 Write the scientific term:

1. It is the energy that will not run out faster than consuming it. (..................)
2. The energy produced due to friction. (..................)
3. It is used in cars to keep the driver's body from moving forward during collision. (..................)
4. Energy that consumed from hand bell. (..................)

3 Complete the following:

1. .... is used to knock down parts of a building.
2. Electricity transfers to cities through ....
3. The wheels of the car .... when fuel burns inside car engine.
4. ...., ... and .... are examples of fossil fuel.

4 Correct the underline words:

1. **Fuel powered-cars** need to be charged. (..................)
2. Life **continues** on the earth in the absence of the sun. (..................)
3. **Charcoal** is made up of grass, corn or wood chips. (..................)
4. Burning of **biofuel** cause air pollution & global warming. (..................)

5 Complete the following table:

Device	Source of Energy	Kind
Flashlight	....	....
Solar heater	....	....
Fire place	....	....

6 Compare between:

Device	Biofuel	Fossil fuel
Type	....	....
Importance	....	....
Disadvantages	....	....
Examples	....	....

Model Answers

Unit 3
Concept 1 Lesson 1

1 Choose the correct answer:

1. b 2. a 3. d
4. d 5. c 6. a
7. c 8. d 9. b
10. a 11. b 12. b
13. a 14. d 15. d
16. a 17. c 18. d

2 Put (✓) or (✗):

1. ✗ 2. ✓ 3. ✓
4. ✓ 5. ✗ 6. ✓
7. ✗ 8. ✓ 9. ✓
10. ✗

3 Fill in the gaps using the following words:

1. Solar cells
2. TV
3. consumed
4. produced
5. electric – heat
6. chemical

4 Write the scientific term:

1. Electric Energy
2. Solar Energy
3. Radio
4. Electric Heater
5. Solar Cell
6. Solar Heater
7. Batteries

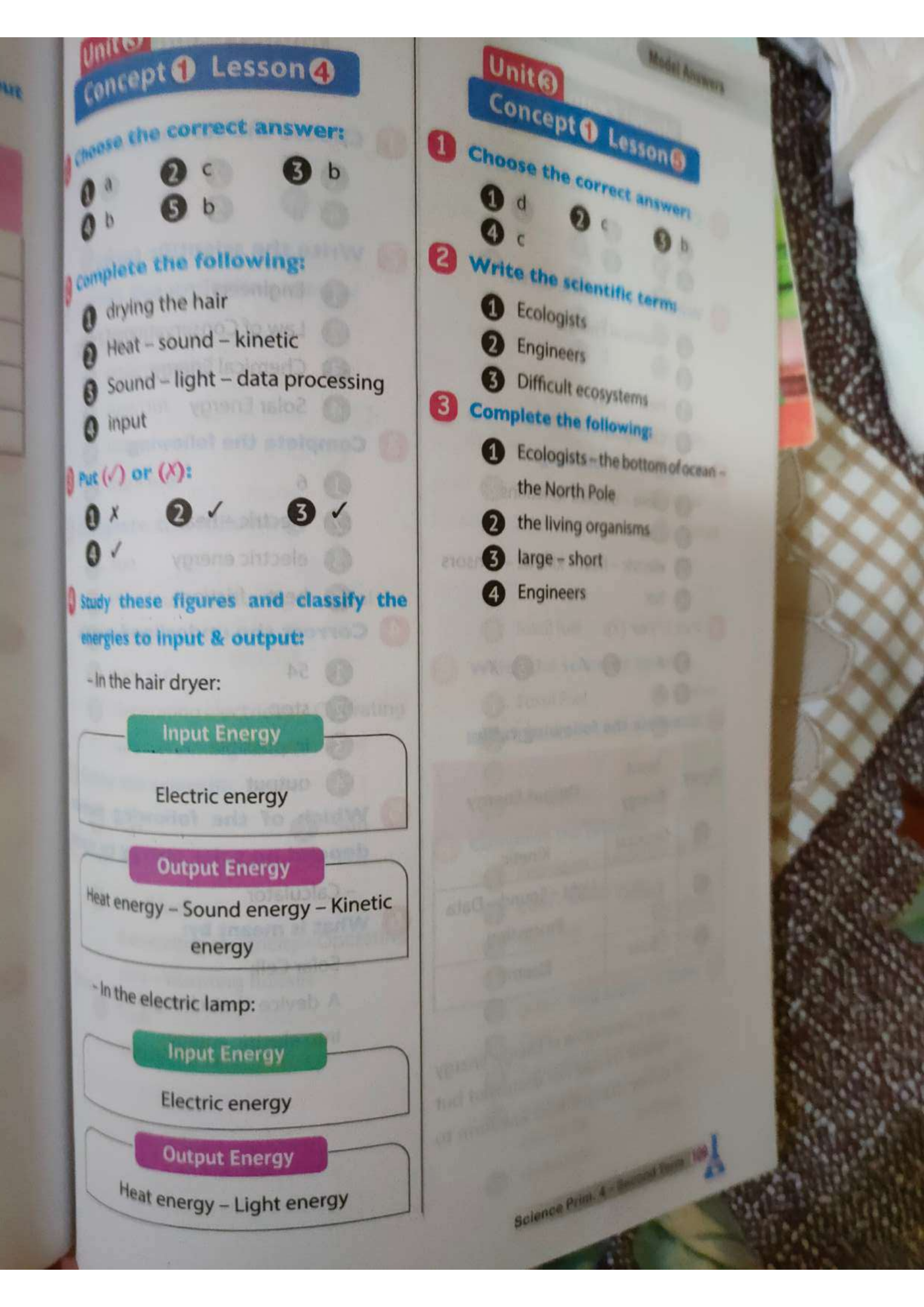
5 Complete the following:

1. TV, cellular phone and radio
2. TV, cellular phone and electric bulb
3. consumed – produced
4. Solar cells
5. electric – sound and light
6. Batteries
7. 6
8. electric – heat – kinetic – sensors
9. plugs – electric chargers
10. batteries

6 Classify the following devices according to devices need for solar energy or electric energy:

Devices that need electric energy
Electric lamp
Mobile phone

Devices that need solar energy
Calculator
Solar cells



Unit 3

Concept 1 Lesson 4

1 Choose the correct answer:

1 a 2 c 3 b
4 b 5 b

2 Complete the following:

1 drying the hair
2 Heat – sound – kinetic
3 Sound – light – data processing
4 input

3 Put (✓) or (✗):

1 ✗ 2 ✓ 3 ✓
4 ✓

4 Study these figures and classify the energies to input & output:

- In the hair dryer:

Input Energy

Electric energy

Output Energy

Heat energy – Sound energy – Kinetic energy

- In the electric lamp:

Input Energy

Electric energy

Output Energy

Heat energy – Light energy

Unit 3

Concept 1 Lesson 5

1 Choose the correct answer:

1 d 2 c 3 b
4 c

2 Write the scientific term:

1 Ecologists
2 Engineers
3 Difficult ecosystems

3 Complete the following:

1 Ecologists – the bottom of ocean – the North Pole
2 the living organisms
3 large – short
4 Engineers

Model Exam 1
Unit 3 Concept 1

1 Choose the correct answer:

1. c 2. d 3. b
4. b 5. c

2 Write the scientific term:

1. Chemical Energy
2. TV
3. Heat Energy
4. Ecologists

3 Complete the following:

1. move – do their functions
2. Coal
3. electric – heat – kinetic – sensors
4. hot

4 Put (✓) or (✗):

1. ✗ 2. ✓ 3. ✗
4. ✗

5 Complete the following table:

Figure	Input Energy	Output Energy
1	Chemical	Kinetic
2	Electric	Light – Sound – Data Processing
3	Solar	Electric

6 What is meant by:

– Law of Conservation of Energy: Energy is neither created nor destroyed but it can be changed from one form to another.

Model Exam 2
Unit 3 Concept 1

1 Choose the correct answer:

1. d 2. b 3. a
4. d 5. c

2 Write the scientific term:

1. Engineers
2. Law of Conservation of Energy
3. Chemical Energy
4. Solar Energy

3 Complete the following:

1. 6
2. electric – heat
3. electric energy
4. heat – friction

4 Correct the underlined words:

1. 54
2. stop
3. impossible
4. output

5 Which of the following devices depend on solar energy to work:

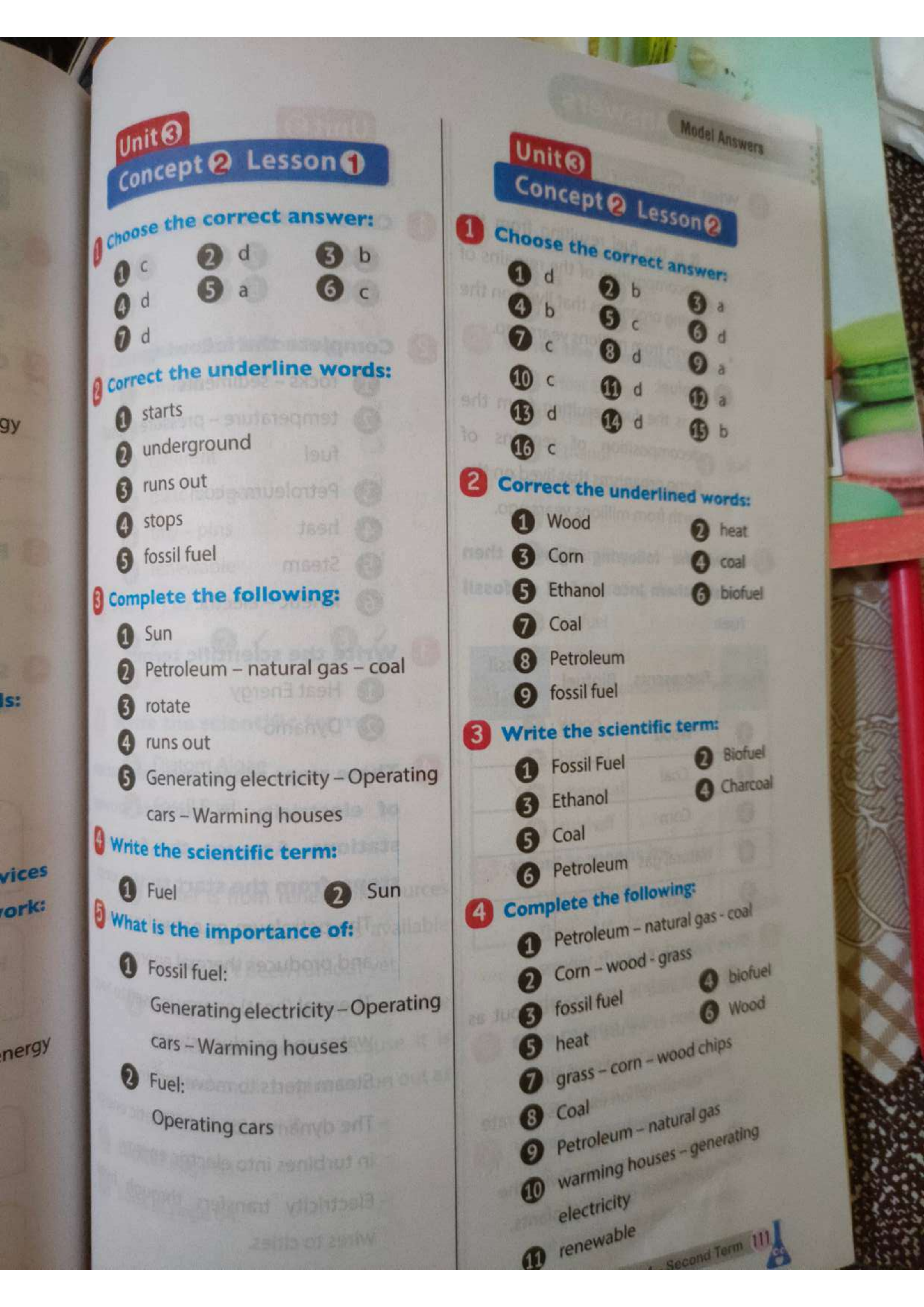
– Calculator

6 What is meant by:

– Solar Cell:

A device that changes solar energy into electric energy.





Unit 3 – Concept 2 Lesson 1

1 Choose the correct answer:

1. c
2. d
3. b
4. d
5. a
6. c
7. d

2 Correct the underline words:

1. starts
2. underground
3. runs out
4. stops
5. fossil fuel

3 Complete the following:

1. Sun
2. Petroleum – natural gas – coal
3. rotate
4. runs out
5. Generating electricity – Operating cars – Warming houses

4 Write the scientific term:

1. Fuel
2. Sun

5 What is the importance of:

1. Fossil fuel: Generating electricity – Operating cars – Warming houses
2. Fuel: Operating cars

Unit 3 – Concept 2 Lesson 2

1 Choose the correct answer:

1. d
2. b
3. a
4. b
5. c
6. d
7. c
8. d
9. a
10. c
11. d
12. a
13. d
14. d
15. b
16. c

2 Correct the underlined words:

1. Wood
2. heat
3. Corn
4. coal
5. Ethanol
6. biofuel
7. Coal
8. Petroleum
9. fossil fuel

3 Write the scientific term:

1. Fossil Fuel
2. Biofuel
3. Ethanol
4. Charcoal
5. Coal
6. Petroleum

4 Complete the following:

1. Petroleum – natural gas - coal
2. Corn – wood - grass
3. fossil fuel
4. biofuel
5. heat
6. Wood
7. grass – corn – wood chips
8. Coal
9. Petroleum – natural gas
10. warming houses – generating electricity
11. renewable

5 What is meant by:

1. Fossil Fuel:
   It is the fuel resulting from the decomposition of the remains of living organisms that lived on the earth from millions years ago.
2. Biofuel:
   It is the fuel resulting from the decomposition of remains of living organisms that lived on the earth from millions years ago.

6 Label the following figures, then classify them into biofuel or fossil fuel:

Figure	Represents	Biofuel	Fossil Fuel
1	Wood	✓	
2	Coal		✓
3	Corn	✓	
4	Natural gas		✓
5	grass	✓	

7 Give reason for:

1. – Because it starts to run out as soon as we use it.
   – Because the rate of our consumption exceeds the rate of its formation.
2. Because it is renewed with the continuous growth of plants.

Unit 3
Concept 2 Lesson 3

1 Choose the correct answer:

1. c 2. a 3. d
4. b 5. a

2 Complete the following:

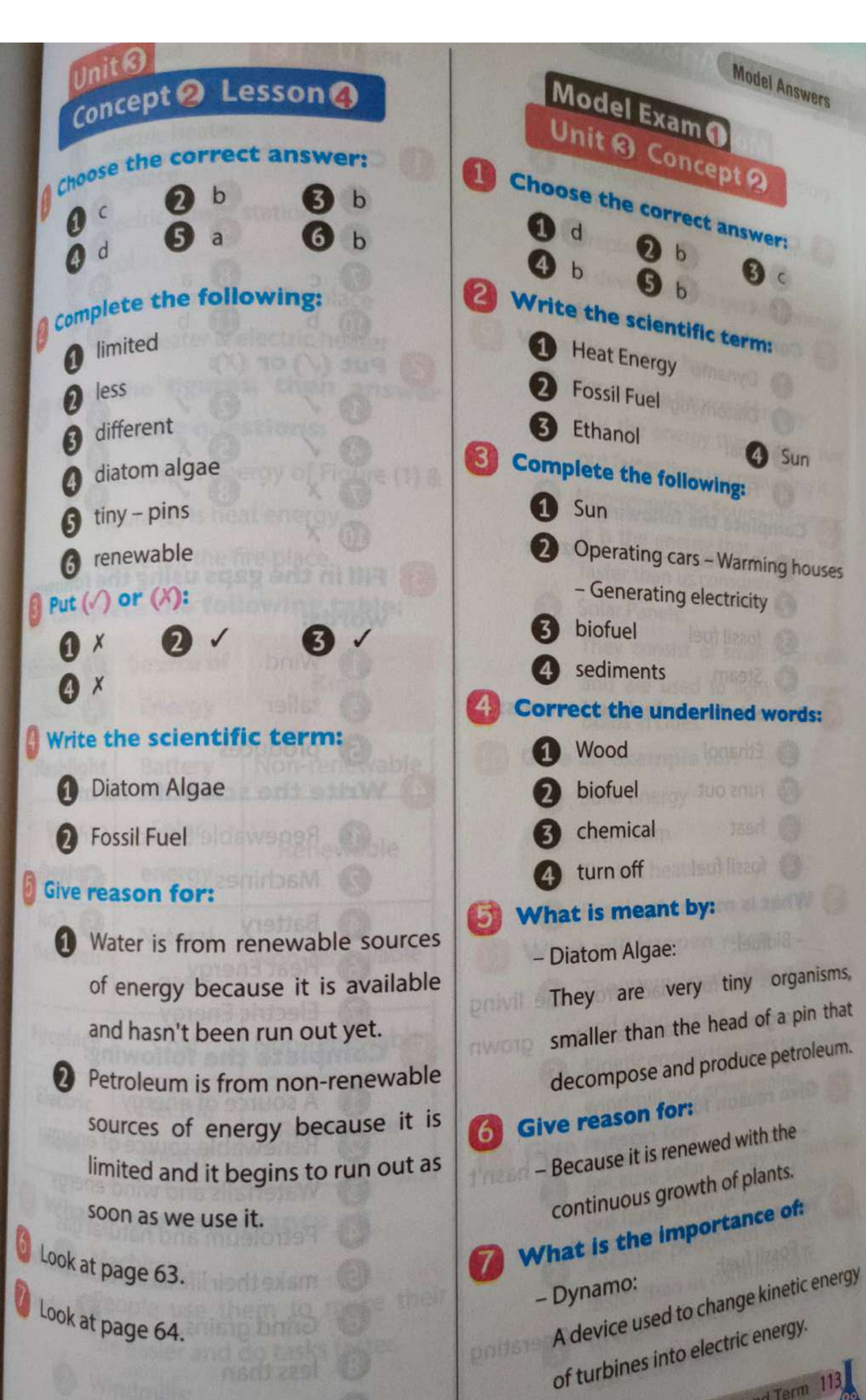
1. rocks – sediments
2. temperature – pressure – fossil fuel
3. Petroleum – coal
4. heat
5. Steam
6. kinetic – electric

3 Write the scientific term:

1. Heat Energy
2. Dynamo

4 These steps represents generation of electricity in electric power stations. Arrange the following steps from the start to the end:

– The petroleum or natural gas burns and produces thermal energy.
– Thermal (heat) energy is used to heat water and produce steam.
– Steam starts to move turbines.
– The dynamo converts kinetic energy in turbines into electric energy.
– Electricity transfers through huge wires to cities.



Unit 3 Concept 2 Lesson 4

1 Choose the correct answer:

1 c 2 b 3 b
4 d 5 a 6 b

2 Complete the following:

1 limited
2 less
3 different
4 diatom algae
5 tiny – pins
6 renewable

3 Put (✓) or (✗):

1 ✗ 2 ✓ 3 ✓
4 ✗

4 Write the scientific term:

1 Diatom Algae
2 Fossil Fuel

5 Give reason for:

1 Water is from renewable sources of energy because it is available and hasn't been run out yet.

2 Petroleum is from non-renewable sources of energy because it is limited and it begins to run out as soon as we use it.

6

Look at page 63.

7

Look at page 64.

Model Exam 1 Unit 3 Concept 2

1 Choose the correct answer:

1 d 2 b 3 c
4 b 5 b

2 Write the scientific term:

1 Heat Energy
2 Fossil Fuel
3 Ethanol
4 Sun

3 Complete the following:

1 Sun
2 Operating cars – Warming houses – Generating electricity
3 biofuel
4 sediments

4 Correct the underlined words:

1 Wood
2 biofuel
3 chemical
4 turn off

5 What is meant by:

– Diatom Algae:
They are very tiny organisms, smaller than the head of a pin that decompose and produce petroleum.

6 Give reason for:

– Because it is renewed with the continuous growth of plants.

7 What is the importance of:

– Dynamo:
A device used to change kinetic energy of turbines into electric energy.

Model Answers

Model Exam 2

Unit 3 Concept 2

1 Choose the correct answer:

1. c
2. c
3. d
4. c
5. b

2 Complete the following:

1. Dynamo
2. Diatom Algae
3. Coal
4. Fuel

3 Complete the following:

1. Petroleum – coal – benzene
2. rotate
3. fossil fuel
4. Steam

4 Correct the underlined words:

1. Ethanol
2. runs out
3. heat
4. fossil fuel

5 What is meant by:

– Biofuel:

It is the fuel made from the living organisms that can be grown (planted).

6 Give reason for:

– Because it is available and hasn't been run out yet.

7 What is the importance of:

– Fossil fuel:

Generating electricity – Operating cars – Warming houses.

Unit 3

Concept 3 Lesson 1

1 Choose the correct answer:

1. b
2. c
3. d
4. b
5. a
6. b
7. c
8. a
9. b
10. b
11. b
12. c

2 Put (✓) or (✗):

1. ✓
2. ✓
3. ✗
4. ✓
5. ✗
6. ✗
7. ✗
8. ✓
9. ✗
10. ✗

3 Fill in the gaps using the following words:

1. Wind
2. chemical
3. taller
4. Coal
5. produces

4 Write the scientific term:

1. Renewable Source of Energy
2. Machines
3. Windmill
4. Battery
5. Coal
6. Heat Energy
7. Electric Energy

5 Complete the following:

1. A source of energy
2. Renewable source of energy
3. Waterfalls and wind energy
4. Petroleum and natural gas
5. make their life easier & do tasks faster
6. Grind grains.
7. shorter
8. less than
9. a source of energy

10 chemical
11 light
12 non-renewable
13 electric heater
14 fireplace
15 electric power stations
16 coal
17 petroleum oven & fireplace
18 solar heater & electric heater

6 Study the figures, then answer the following questions:

1. The output energy of Figure (1) & Figure (2) is heat energy.
2. Figure (2), the fire place.

7 Complete the following table:

Device	Source of Energy	Kind
Flashlight	Battery	Non-renewable
Solar heater	Solar energy	Renewable
Gas oven	Natural gas	Non-renewable
Fireplace	Coal	Non-renewable
Electric heater	Electric energy	Renewable

8 What is the importance of:

1. Machines:
   People use them to make their life easier and do tasks faster.
2. Windmills:
   They are used for grinding grains.
3. Solar panels:
   They are used to generate electricity.
4. Flashlight:
   A device used to get light energy.
5. Fireplace:
   A device used to get heat energy for warming houses.

9 What is meant by:

1. Renewable Source of Energy:
   It is the energy that will not run out faster than us consuming it.
2. Non-renewable Source of Energy:
   It is the energy that will run out faster than us consuming it.
3. Solar Panels:
   They consist of small solar cells and are used to light up street bulbs in cities.

10 Give an example for:

1. Solar energy
2. Petroleum
3. Electric heater
4. Fireplace

11 What will happen when:

1. The internal parts of the mill move and grind grains.
2. Kinetic energy transfers to another windmill and grind grains

12 Give reason for:

1. Because solar energy will not run out faster than us consuming it.
2. Because petroleum will run out faster than us consuming it.
3. To make their life easier and get tasks done faster.

Unit 3

Concept 3 Lesson 2

1 Choose the correct answer:

1. a 2. c 3. b
4. c 5. d 6. b
7. d 8. b 9. d
10. b 11. a 12. b
13. a 14. d 15. d
16. b

2 Put (✓) or (✗):

1. ✓ 2. ✗ 3. ✓
4. ✓ 5. ✗ 6. ✓
7. ✗ 8. ✗

3 Write the scientific term:

1. Photosphere
2. Greenhouse
3. Curved Mirrors
4. Solar Heater
5. Solar Panels
6. Solar Energy

4 Complete the following:

1. hydrogen – helium
2. photosphere
3. light – heat
4. damaged
5. die
6. radioactivity
7. Greenhouse
8. Curved mirrors
9. top of buildings
10. solar cells
11. solar – electric – heat
12. solar

5 What is meant by:

1. Photosphere:
   It is a gas region at the edge of the Sun that emits light and heat.
2. Solar Energy:
   It is the energy produced from the sun.
3. Solar Panels:
   They consist of a large number of small solar cells & are used in generating electricity.
4. Greenhouse:
   It helps farmers in planting crops that need hot weather in winter.

6 Study the figures, then answer the following questions:

1. a. Figure (2)
   b. All animals will die.
   c. It provides us with light and heat & plants need it to grow.
2. a. Curved mirrors
   b. They are used to direct sun rays towards the cooking pans for cooking.
3. a. solar energy b. heat energy
   c. top of the buildings
4. a. solar energy
   b. batteries – solar cells

7 What is the importance of:

1. The sun:
   It provides us with light and heat and plants need it to grow.

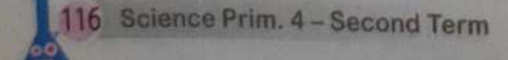
2 Solar energy
It is used to
light up ho
3 Solar panel
1. They ar
electric
streets
2. They
the ba
4 Curved r
They ar
toward
5 Greenh
It help
that n

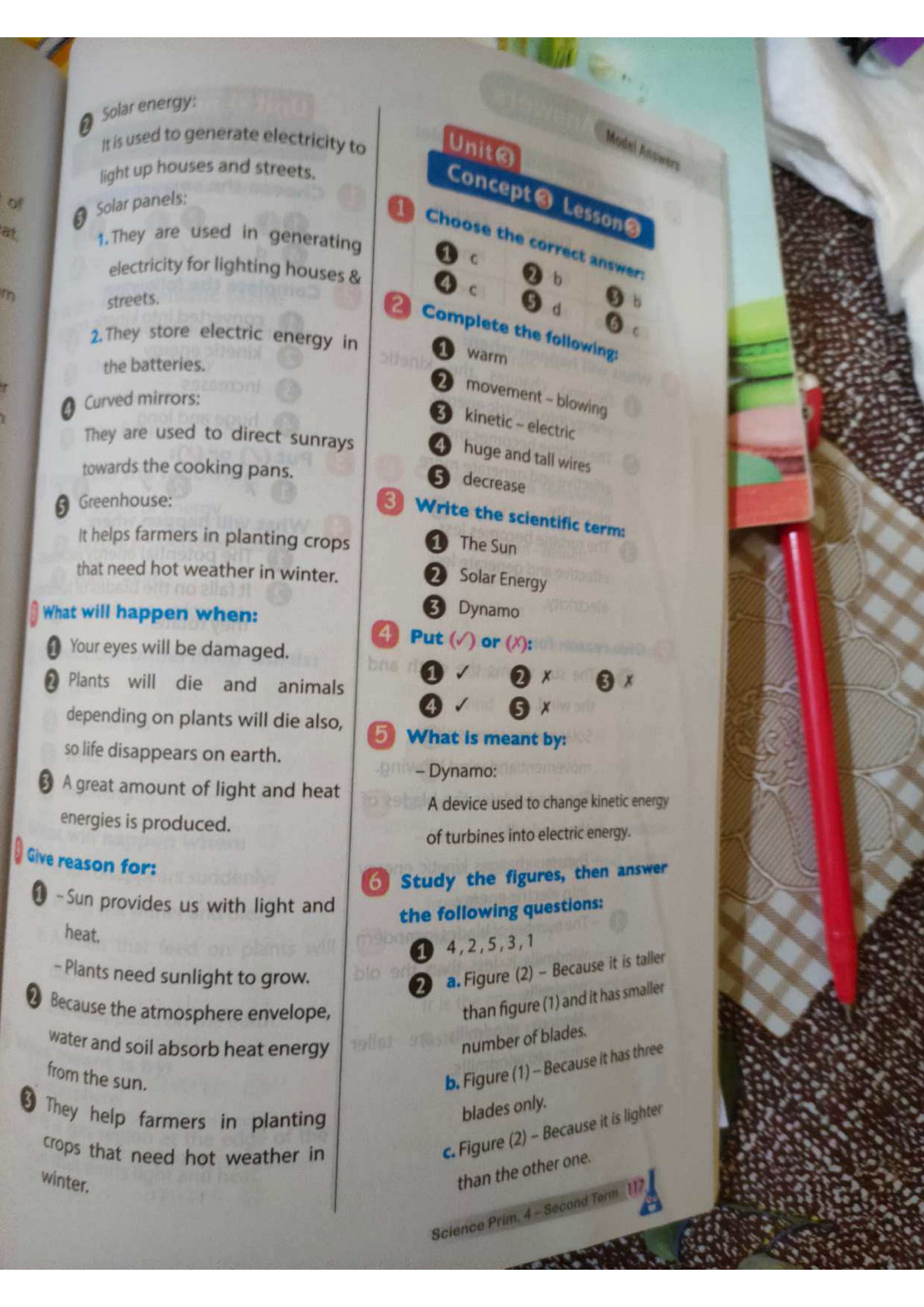
8 What will

1 Your
2 Plant
depe
so li
3 A g
ene

9 Give re

1 – S
–
2 B
3





2 Solar energy:

It is used to generate electricity to light up houses and streets.

3 Solar panels:

1. They are used in generating electricity for lighting houses & streets.
2. They store electric energy in the batteries.

4 Curved mirrors:

They are used to direct sunrays towards the cooking pans.

5 Greenhouse:

It helps farmers in planting crops that need hot weather in winter.

What will happen when:

1. Your eyes will be damaged.
2. Plants will die and animals depending on plants will die also, so life disappears on earth.
3. A great amount of light and heat energies is produced.

Give reason for:

1. – Sun provides us with light and heat.
   – Plants need sunlight to grow.
2. Because the atmosphere envelope, water and soil absorb heat energy from the sun.
3. They help farmers in planting crops that need hot weather in winter.

Unit 3

Concept 3 Lesson 3

1 Choose the correct answer:

1 c 2 b 3 b
4 c 5 d 6 c

2 Complete the following:

1. warm
2. movement – blowing
3. kinetic – electric
4. huge and tall wires
5. decrease

3 Write the scientific term:

1. The Sun
2. Solar Energy
3. Dynamo

4 Put (✓) or (✗):

1 ✓ 2 ✗ 3 ✗
4 ✓ 5 ✗

5 What is meant by:

– Dynamo:

A device used to change kinetic energy of turbines into electric energy.

6 Study the figures, then answer the following questions:

1. 4, 2, 5, 3, 1
2. a. Figure (2) – Because it is taller than figure (1) and it has smaller number of blades.
   b. Figure (1) – Because it has three blades only.
   c. Figure (2) – Because it is lighter than the other one.

7 Complete the following table:

Device	Input Energy	Output Energy
Motor	Electric	Kinetic
Dynamo	Kinetic	Electric

8 What will happen when:

1. Dynamo changes the kinetic energy into electric energy.
2. The turbine becomes more effective and generate more electricity.
3. The turbine becomes less effective and generate less electricity.

9 Give reason for:

1. – The sun warms the earth and the wind.
   – Solar energy causes air movement and wind blowing.
   – The wind rotates the blades of the windmill.
   – Dynamo changes kinetic energy into electric energy.
2. – The number of blades in modern windmills is less than the old windmills.
   – Modern windmills are taller than old windmills.

Unit 3

Concept 3 Lesson 4

1 Choose the correct answer:

1. b 2. a 3. c
4. d

2 Complete the following:

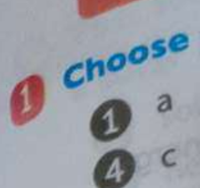
1. converted into kinetic energy
2. kinetic energy
3. increases
4. huge and long

3 Put (✓) or (✗):

1. ✗ 2. ✓ 3. ✗

4 What will happen when:

1. The potential energy increases.
2. It falls on the blades of turbines so they rotate.



Model Exam 1
Unit 3 Concept 3

1. Choose the correct answer:
   1. a 2. b 3. c
   4. c 5. b
2. Write the scientific term:
   1. Renewable Source of Energy
   2. Chemical Energy
   3. Greenhouse
   4. Solar Energy
3. Complete the following:
   1. a source of energy
   2. Fireplace – petroleum oven
   3. light – heat
   4. movement – blowing
4. Correct the underlined words:
   1. taller
   2. Natural gas
   3. Wind
   4. incoming
5. What will happen when:
   - The sun disappears suddenly:
     1. Plants will wither and die.
     2. Animals that feed on plants will die.
     3. Life disappears on the earth.
6. What meant is by:
   - Photosphere:
     It is a gas region at the edge of the Sun that emits light and heat.

Model Exam 2
Unit 3 Concept 3

1. Choose the correct answer:
   1. c 2. b 3. c
   4. d 5. c
2. Write the scientific term:
   1. Machines
   2. Coal
   3. Photosphere
   4. Solar Panel
3. Complete the following:
   1. top of buildings
   2. hydrogen - helium
   3. taller
   4. Fireplace
4. Correct the underlined words:
   1. Some
   2. Wind
   3. Dynamo
   4. potential
5. Give reason for:
   - Because the atmosphere envelope, water and soil absorb heat energy from the sun.
6. What is meant by:
   - Renewable Source of Energy:
     It is the energy that will not run out faster than us consuming it.

Model Exams

Model Exam 1

1 Choose the correct answer:

1. d 2. c 3. c
4. d

2 Write the scientific term:

1. Photosphere
2. Solar Energy
3. Law of Conservation of Energy
4. Wrecking Ball

3 Complete the following:

1. 6
2. electric – heat 3. light
4. chemical – devices (toy cars)

4 Correct the underlined words:

1. Ethanol
2. Fuel-powered
3. starts 4. output

5 Mention the input and output energies of the following:

Figure	Input Energy	Output Energy
Hair dryer	Electric	Heat – Sound – kinetic
Electric lamp	Electric	Light – Heat
Playing football	Chemical	kinetic

6 What is meant by:

– Renewable Source of Energy:
It is the energy that will not run out faster than us consuming it.

7 Give reason for:

– To make their life easier and get tasks done faster.

8 What is the importance of:

– It helps farmers grow plants that need warm weather in winter.

Model Exam 2

1 Choose the correct answer:

1. b 2. a 3. d
4. b

2 Write the scientific term:

1. Wrecking Ball
2. Electric Bulb
3. Kinetic Energy
4. Fuel

3 Complete the following:

1. more
2. electric – sound – heat – kinetic
3. climate changes
4. Petroleum – Natural gas

4 Correct the underlined words:

1. Fuel-powered
2. fireplace

3. starts
4. transferred

5 The following figu... a solar heater:

1. solar energy
2. heat energy
3. top of the build...

6 What will happen...

– Your eyes will be d...

7 What is the impo...

1. It is used to kee... from moving... collision.
2. They can gene...

Model Ex...

1 Choose the corr...

1. c 2. c...
4. d

2 Write the scien...

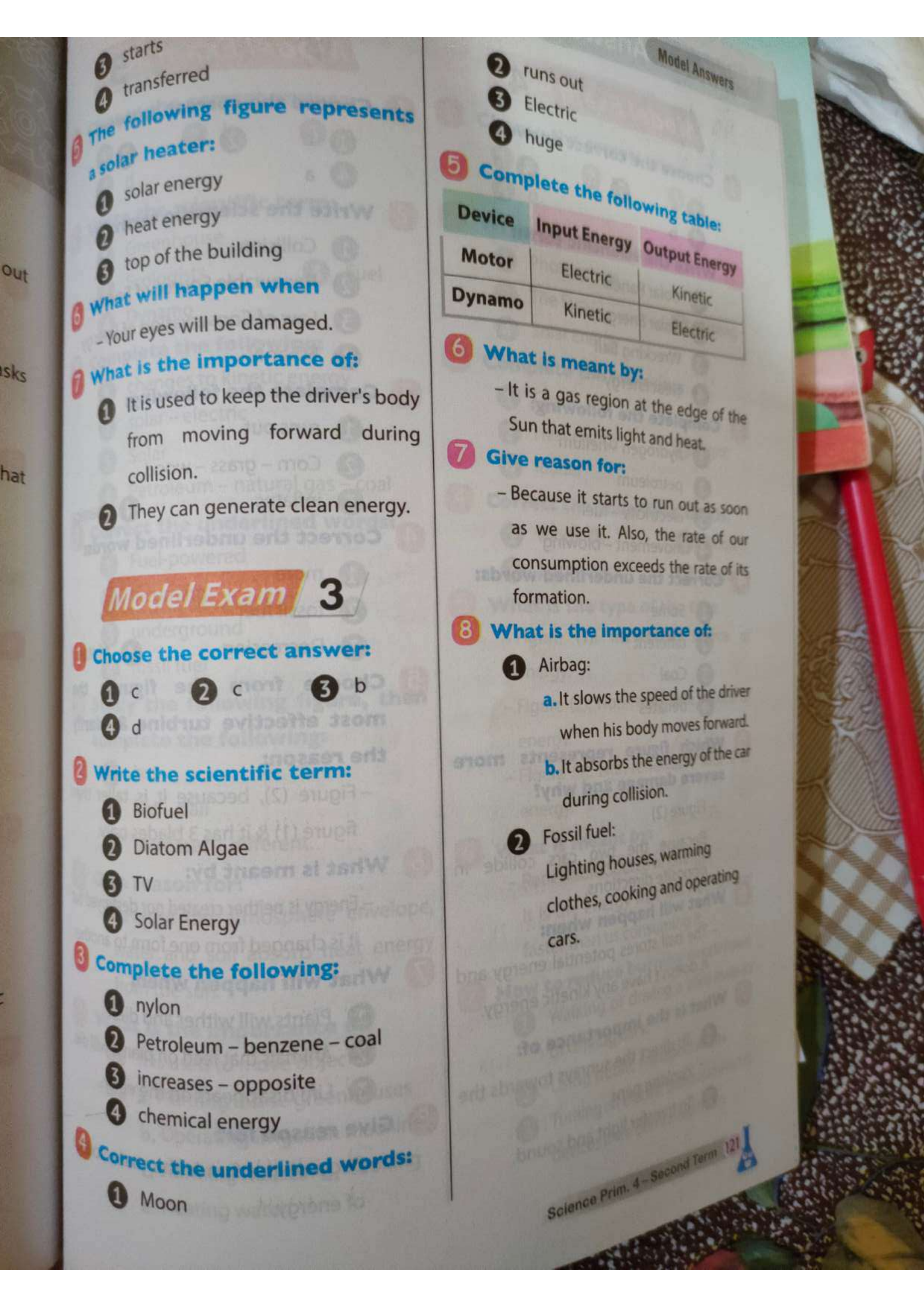
1. Biofuel
2. Diatom Alga...
3. TV
4. Solar Energy...

3 Complete the ...

1. nylon
2. Petroleum ...
3. increases ...
4. chemical e...

4 Correct the u...

1. Moon



3. starts
4. transferred

5 The following figure represents a solar heater:

1. solar energy
2. heat energy
3. top of the building

6 What will happen when

- Your eyes will be damaged.

7 What is the importance of:

1. It is used to keep the driver's body from moving forward during collision.
2. They can generate clean energy.

Model Exam 3

1 Choose the correct answer:

1. c
2. c
3. b
4. d

2 Write the scientific term:

1. Biofuel
2. Diatom Algae
3. TV
4. Solar Energy

3 Complete the following:

1. nylon
2. Petroleum – benzene – coal
3. increases – opposite
4. chemical energy

4 Correct the underlined words:

1. Moon
2. runs out
3. Electric
4. huge

5 Complete the following table:

Device	Input Energy	Output Energy
Motor	Electric	Kinetic
Dynamo	Kinetic	Electric

6 What is meant by:

- It is a gas region at the edge of the Sun that emits light and heat.

7 Give reason for:

- Because it starts to run out as soon as we use it. Also, the rate of our consumption exceeds the rate of its formation.

8 What is the importance of:

1. Airbag:
   a. It slows the speed of the driver when his body moves forward.
   b. It absorbs the energy of the car during collision.
2. Fossil fuel:
   Lighting houses, warming clothes, cooking and operating cars.

Model Answers

Model Exam 4

1 Choose the correct answer:

1. c
2. b
3. d
4. b

2 Write the scientific term:

1. Solar Panels
2. Solar Energy
3. Wrecking Ball
4. Heat Energy

3 Complete the following:

1. hydrogen – helium
2. petroleum
3. electricity – fuel
4. movement – blowing

4 Correct the underlined words:

1. Some
2. different
3. Coal
4. deflates

5 Which figure represents more severe damage and why?

– Figure (2)

Because the two cars collide in opposite directions.

6 What will happen when:

– The ball stores potential energy and it doesn't have any kinetic energy.

7 What is the importance of:

1. To direct the sunrays towards the cooking pans.
2. To transfer light and sound.

Model Exam 5

1 Choose the correct answer:

1. b
2. b
3. c
4. a

2 Write the scientific term:

1. Collision
2. Renewable Source of Energy
3. Law of Conservation of Energy
4. Ethanol

3 Complete the following:

1. runs out
2. Corn – grass – wood
3. inflates
4. chemical

4 Correct the underlined words:

1. more
2. fossil fuel
3. Decreasing
4. Motor

5 Choose from the figures the most effective turbine & clarify the reason:

– Figure (2), because it is taller than figure (1) & it has 3 blades only.

6 What is meant by:

– Energy is neither created nor destroyed but it is changed from one form to another.

7 What will happen when:

1. Plants will wither and die.
2. Animals that feed on plants will die.
3. Life disappears on the earth.

8 Give reason for:

– Because the Sun is the main source of energy.

Model Exam 6

Choose the correct answer:

1. c 2. b 3. c
4. d

Write the scientific term:

1. Greenhouse
2. Ecologists 3. Fuel
4. Dynamo

Complete the following:

1. changes to kinetic energy
2. solar – electric
3. Solar
4. Petroleum – natural gas – coal

Correct the underlined words:

1. Fuel-powered
2. Incoming
3. underground
4. fossil fuel

Study the following figure, then complete the following:

1. bat
2. bat – ball
3. increases – different.

Give reason for:

- Because the atmosphere envelope, water and soil absorb heat energy from the sun.

What is the importance of:

1. It is used to move objects.
2. a. Planting inside greenhouses
 b. Operating irrigation machines
 c. Warming houses d. Cooking
 e. Heating water

Model Exam 7

1 Choose the correct answer:

1. c 2. a 3. d
4. d

2 Write the scientific term:

1. Photosphere
2. The Sun 3. Airbag
4. Solar Energy

3 Complete the following:

1. Coal
2. Heat energy 3. light
4. louder

4 Correct the underlined words:

1. windmills 2. Wood
3. puzzle 4. stops

5 What is the type of the fuel:

- Figure (1): Renewable source of energy.
- Figure (2): Non-renewable source of energy.
- Figure (3): Non-renewable source of energy.

6 What is meant by:

- Renewable Source of Energy:
 It is the energy that will not run out faster than us consuming it.

7 How to reduce burning fossil fuel:

1. Walking or driving a bike instead of driving cars.
2. Using public transportations.
3. Turning off electric bulbs and electric devices if we don't need them.



Model Answers

Model Exam 8

1 Choose the correct answer:

1. c
2. c
3. b
4. a

2 Write the scientific term:

1. Solar Vehicle
2. Heat Energy
3. Fossil Fuel
4. Electric Energy

3 Complete the following:

1. same
2. Chemical energy
3. electric power stations
4. high

4 Correct the underlined words:

1. input
2. bike
3. Coal
4. heat

5 Arrange the following energy chains from the start to the end:







6 What is meant by:

– Solar panels

They consist of a large number of small solar cells. They change solar energy into electric or heat energies.

7 Give reason for:

– A part of the electric energy changes to heat energy. So you feel hot when you approach your hand to it.

Model Exam 9

1 Choose the correct answer:

1. a
2. b
3. b
4. c

2 Write the scientific term:

1. Electric Vehicle
2. Cricket Game
3. Fossil Fuel
4. Greenhouse

3 Complete the following:

1. decrease
2. 6
3. hot
4. less

4 Correct the underlined words:

1. dynamo
2. starts
3. biofuel
4. turn off

5 Mention the advantages and disadvantages of solar vehicles:

Advantages

1. They don't need fuel.
2. They don't need electricity.
3. They don't cause climate changes.
4. They are light in weight.

Disadvantage

The amount of energy it gets from the sun is smaller than what it gets from gasoline or electricity.

6 What is the importance of:

– It is used by construction workers to knock down parts of buildings.

Model Exam 10

1 Choose the correct answer:

1. b
2. c
3. b
4. b

2 Write the scientific term:

1. Renewable Source of Energy
2. Heat Energy
3. Seatbelt
4. Kinetic Energy

3 Complete the following:

1. Wrecking ball
2. huge wires
3. rotates
4. Petroleum – natural gas – coal

4 Correct the underlined words:

1. Electric cars
2. disappears
3. Ethanol
4. fossil fuel

5 Complete the following table:

Device	Source of energy	Source of Energy Kind
Flashlight	Chemical energy	Non-renewable
Solar heater	Solar energy	Renewable
Fireplace	Coal	Non-renewable

6 Compare between:

P.O.C.	Biofuel	Fossil Fuel
Its type	Renewable	Non-renewable
Importance	1. Lighting houses 2. Warming houses 3. Cooking 4. Operating cars	It is a renewable source of energy.
Disadvantages	It causes: 1. Air pollution. 2. Global warming.	To get it, it requires: 1. Cutting trees 2. Removal of forests.
Examples	1. Petroleum 2. Natural gas 3. Benzene 4. Coal	1. Wood 2. Grass 3. Corn 4. Wood chips